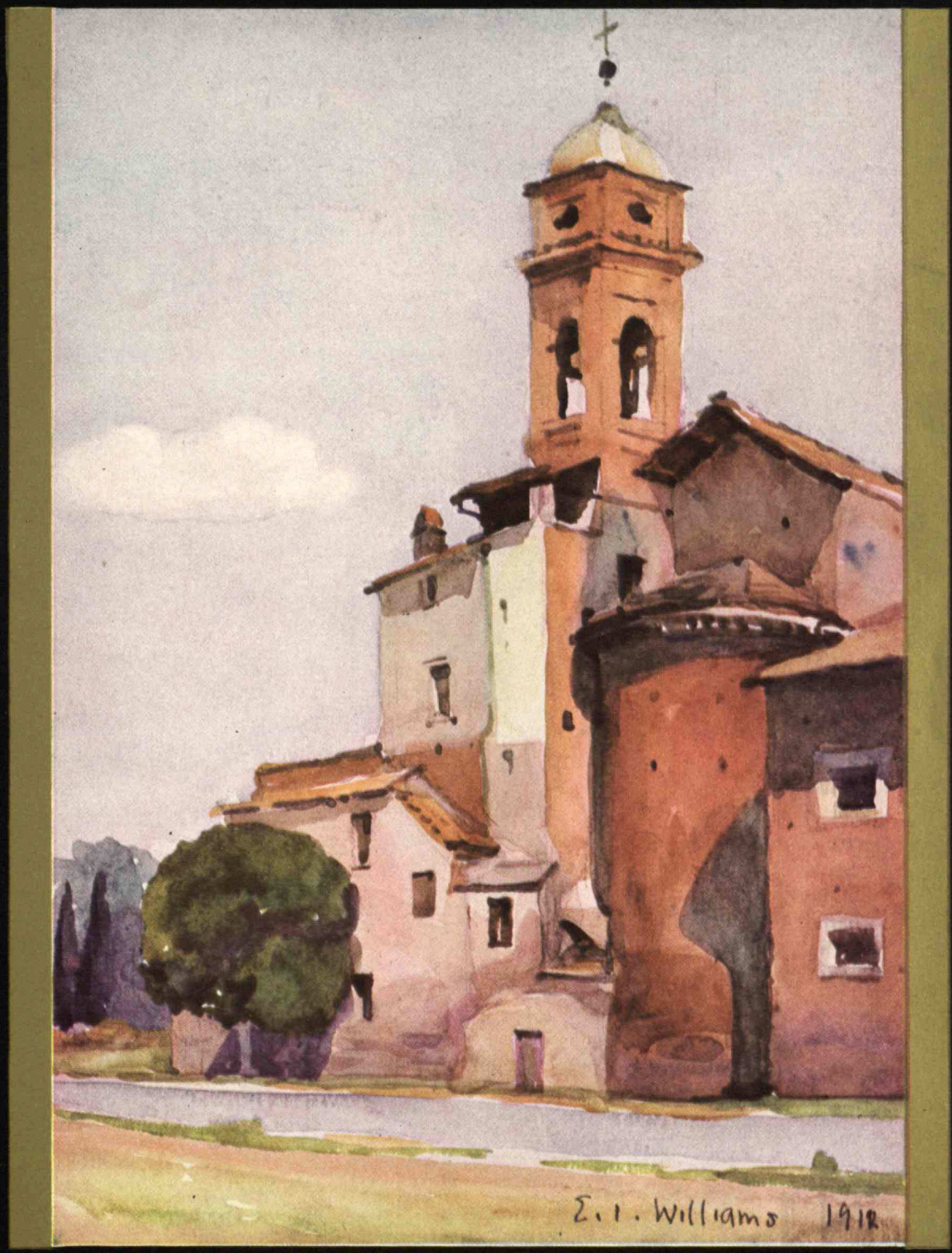
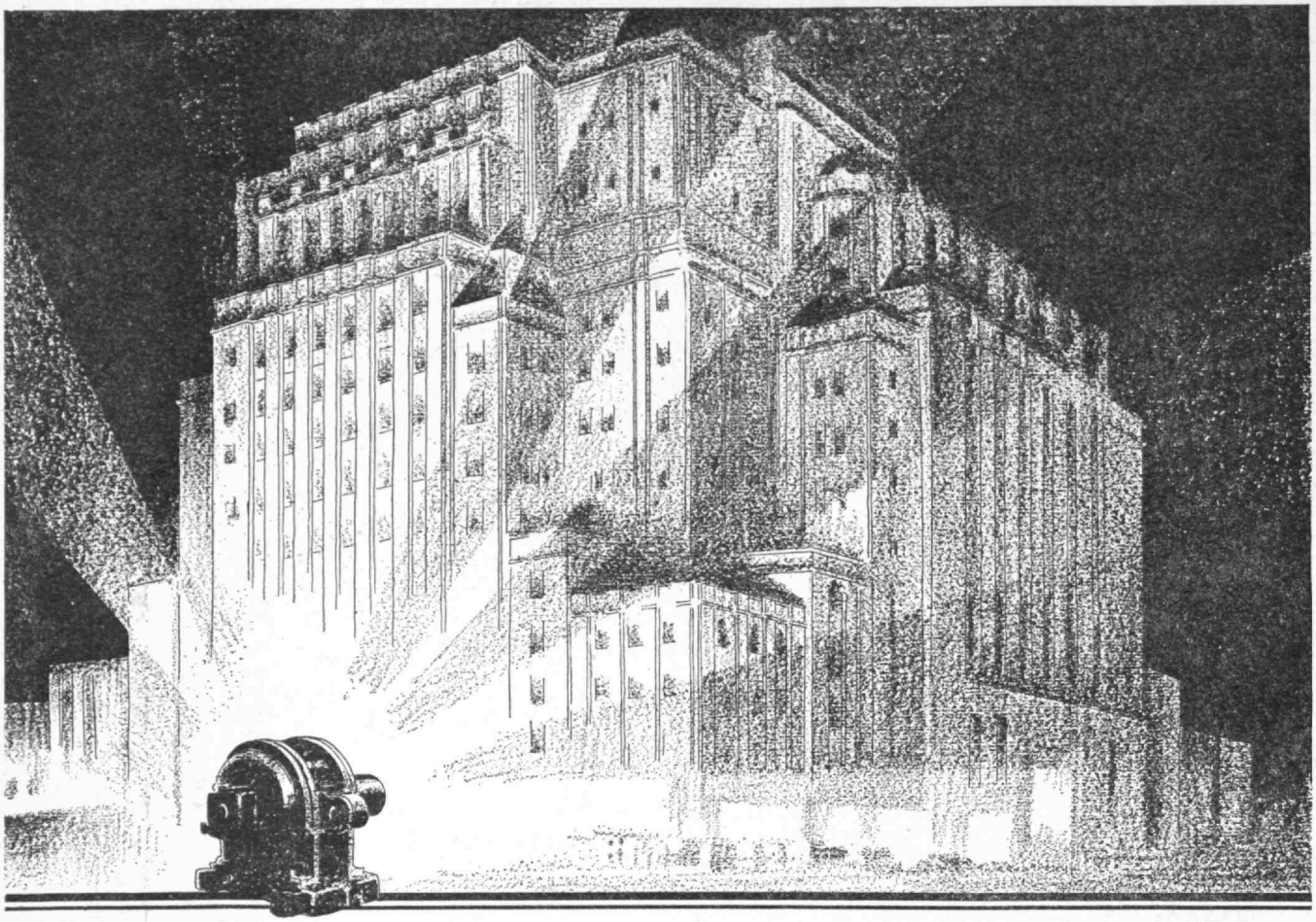
THE TECHNOLOGY REVIEW

JANUARY 1931



technology
review
Published by MIT

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How the new Strawbridge and Clothier Store in Philadelphia will look in 1931. The first department-store building of set-back design in America—Electrically equipped throughout by General Electric. Turner Construction Company, General Contractor. Woodfield-Thompson Company, Electrical Contractors. Simon & Simon, Architects.

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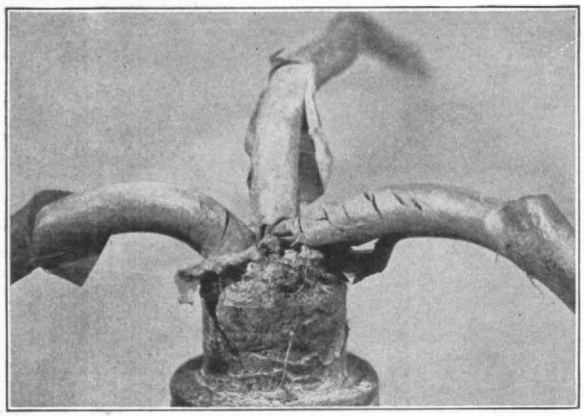
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Eliminates Ozone

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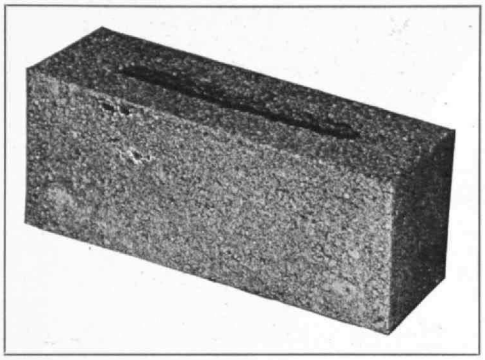
THE TABULAR VIEW

READERS of The Review have in a very gratifying way signified their appreciation of its monthly survey of scientific and technical developments. The many letters we have received indicate that items which have appeared in the "Trend of Affairs" section not only have informed Review readers but have suggested to them industrial opportunities and warned them against the all too common fads and frauds of pseudo-science. In preparing this section we do not pretend to completeness, but we are desirous rather of including in it as great a variety of interesting and valuable information as can be focussed in so small an area. ¶ Toward this end The Review has acquired the services of two more contributing editors who will add each month important and interesting items from their particular field. With this issue Tenney L. Davis, '13, Associate Professor of Organic Chemistry here at the Institute, and W. P. Cutter of the Harvard Business School begin their monthly contributions to this section. For this issue, Professor Davis prepared the article on "Alchemy in Old New England" and Mr. Cutter the article on windowless buildings. Review readers, we are sure, will welcome these new contributors.

FEW men who are not themselves scientists or engineers have more to say to members of those professions than Charles A. Beard, authority on American history, on government, and on American civilization. He has inquired into the meaning and effect of modern technology with more care and perspicacity than probably any other American scholar. It will be recalled that several years ago he edited a book entitled "Whither Mankind" which advanced the thesis that what is called western civilization as distinguished from other cultures is, in reality, a civilization of technology resting at bottom on science and machinery. It will also be recalled that this book was followed by another symposium called "Toward Civilization" in which a group of scientists and engineers inquired into the "dynamics of their laborers with particular reference to the human aspects." In that volume Professor Beard contributed an admirable introduction and summary, distinguished alike for its sympathetic attitude towards the methods and spirit of technology and by a dispassionate criticism. "Engineers," wrote Professor Beard in that book, "recognize the significance of that marvelous instrument of the human mind — the invention of invention, although they rely upon it for making immense advances in the future, they still find that electric fluid, imagination, absolutely essential to the achievement of results in the realm of the unexplored and unprecedented. Without it, science and engineering become dogmatic and sterile. It must be and is being cultivated and nourished as one of the essential forces of the modern world. Imagination, informed by the known laws of nature, but unbound and free to experiment and dare, combined with the spirit of rationality, lives and flowers in the engineering age and will swing new planets into the ken of those who watch the heavens for signs of the future."

(Continued on page 172)


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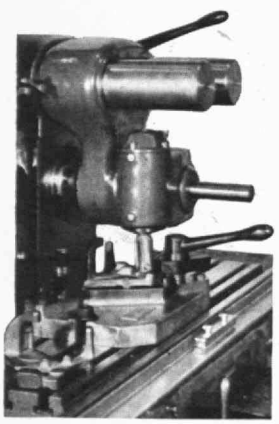
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THE TABULAR VIEW

(Continued from page 170)

¶ Because Professor Beard sees the modern scene so clearly, and because he appreciates and understands the problems and motives of the scientist and technologist, The Review is particularly happy to present in its pages an article by him, written in collaboration with his son, a graduate of the Institute in the class of 1928.

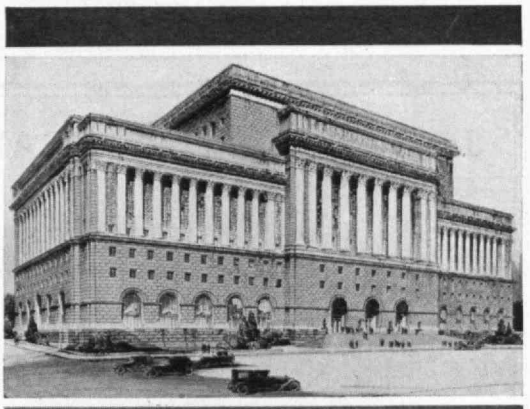
THE article, "Machine Age Politics," is a development of one of the theses set forth in "The American Leviathan," the book that has just been published by Professor Beard and his son. The Beards in their article point out what technology has done to government. The fact that it plays so large a part implies a responsibility on the part of engineers, a responsibility which we are optimistic enough to believe the more intelligent and informed engineers realize. ¶ As evidence of this we point to the formation of the American Engineering Council in the spring of 1917. This body, representing 57,000 of the leading professional engineers of the United States, has as its object the furthering of public welfare wherever technical and engineering knowledge and experience are involved. In its actual operation the Council has assisted the federal government in every possible and legitimate manner on engineering questions. It has been able to thwart many unwise and ill-conceived enterprises and it has been able to suggest creative work entirely beyond the purview of the politicians. ¶ We cannot pass on without noting the versatility of the Beard family. Mrs. Beard was co-author with her husband in writing the "Rise of American Civilization" and she has also published books on labor questions. William was a brilliant student at the Institute, taking the Course in Civil Engineering. Professor Beard himself has a broad academic and professional background. He holds degrees from De Pauw University and Columbia and has studied at Cornell and Oxford University, England. For many years he was a professor of politics at Columbia University. From 1917 to 1922 he was director of the Training School for Public Service in New York City. As director of Institute Municipal Research in Tokyo and as adviser to Viscount Goto, minister of home affairs after the earthquake in 1923, he added to his knowledge of foreign affairs. At present he is living in New Milford, Conn.

FOR THE second time this year, Dr. Karl T. Compton writes for The Review. In "An American Faraday" he gives a comprehensive survey of the inventions of Elihu Thomson, director of the Thomson Laboratory of the General Electric Company, Lynn, Mass., inventor of electric welding, and holder of 700 patents for inventions in electric lighting. At the present time he is engaged in a new line of activity — constructing the largest telescope mirror ever undertaken. ¶ Since the writing of this article, the Society of Mechanical Engineers has conferred an honorary membership on Dr. Thomson for his distinguished work as an inventor. In the words of

(Concluded on page 174)

Milwaukee County Court House Building

Completely Equipped with Johnson Control



All of the heating and ventilating equipment in this building is automatically controlled by the Johnson System of Temperature Control. The direct radiation is controlled by the Johnson dual thermostats which operate the valves on the direct radiators so as to maintain a normally even temperature in the offices and rooms during the day and by means of a switch under control of the engineer automatically operating the valves at a lower temperature during the night. There are ten main mechanical ventilating systems all equipped with Johnson control. The thirty court rooms are heated by indirect systems of heating and ventilating controlled by Johnson thermostats operating on mixing dampers. The Judges' Chambers are provided with individual heating and ventilating systems employing unit ventilating machines completely controlled by Johnson thermostats. All fresh air intake, recirculating and exhaust ducts are provided with Johnson dampers which are operated by pneumatic switches under control of the engineer. Architects: Albert Randolph Ross, New York and Milwaukee. Heating and Ventilating: Wenzel & Henoch, Milwaukee. John Messmer, Superintendent of Buildings, Milwaukee County.

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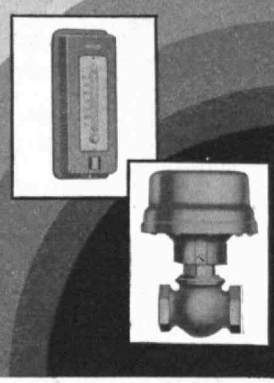
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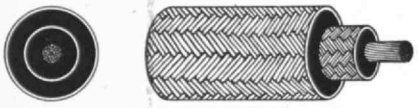
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U. S. Patent 1458803

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THE TABULAR VIEW

(Concluded from page 172)

Dr. Compton, Elihu Thomson has "combined in a most remarkable way the constructive powers of the inventor, the thoroughness and soundness of the man of science, and the kindly balance of the ideal philosopher, teacher and friend." ¶ Dr. Compton has remarked on the difficulty he once experienced, as have many others, in disentangling the contributions of the Thomsons to electrical engineering. There are more than a half dozen "Thomsons" to be found in the indices of scientific histories. To clarify the situation we have listed below some of them, together with notes on their achievements:

JAMES THOMSON (1822–1892). A British physicist and engineer at Glasgow University, renowned for work in thermodynamics, hydraulics, and civil engineering.

WILLIAM THOMSON, LORD KELVIN, (1824–1907). A British physicist and brother of James. He proposed the absolute scale of temperature and put the dynamical theory of heat into such a form as to command universal acceptance. His work in the field of submarine telegraphy gave him his world-wide reputation. In all, he published more than 300 papers covering every branch of physical science.

SIR JOSEPH JOHN THOMSON (1856–). A British physicist at Cambridge University, who carried out epoch-making investigations on the conduction of electricity through gases, the determination of the charge and mass of the electron, and analysis by means of positive rays.

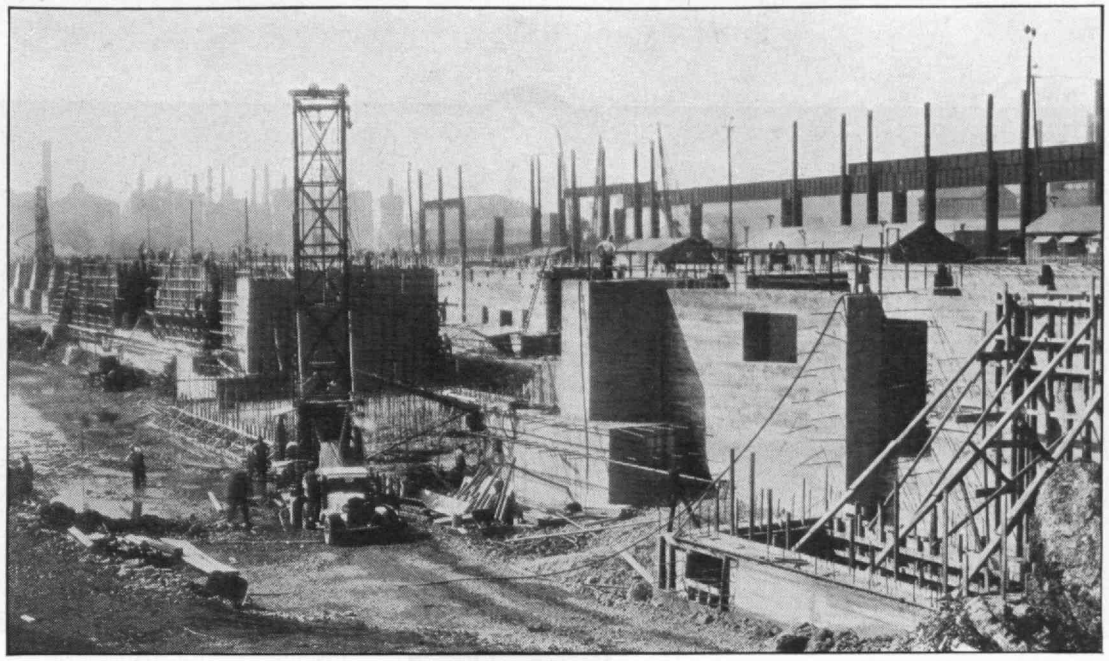
These three, together with Professor Thomson of Swampscott, have added immensely to our knowledge of electricity.

To round out the Thomson saga, two scientists of that name who have worked in other fields should be mentioned:

JOHN ARTHUR THOMSON (1861–), biologist.
JOSEPH THOMSON (1858–1895), explorer.

THE author of the significant article on the irradiation of foods, Mr. John J. Rowlands, is a Contributing Editor to The Review. He wishes to express his indebtedness to workers in the Departments of Physics and Biology of the Institute. Robert S. Harris, '28, associate of the Department of Biology and Public Health, conducted a 24-day experiment on rats, the results of which are shown by illustrations and the text accompanying them. Donald C. Stockbarger, '19, Assistant Professor of Physics, was likewise coöperative and helpful in preparing "Treating Food with Light."

THOMAS J. KILLIAN, who reviewed Sir James Jeans' book, "The Mysterious Universe," for this issue of The Review, was graduated from the Institute in the class of 1925 and received his master's degree in 1926. Later he received a Ph.D. from Princeton University. He is now an instructor in Physics at Technology and a member of the Research Laboratory in Experimental Physics.



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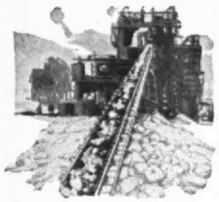
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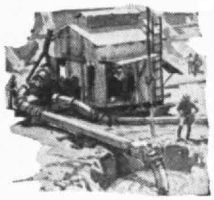
CAN YOU USE THIS MAN?—



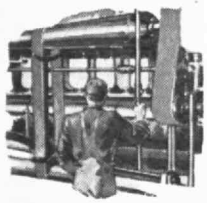
His record recommends that you think it over carefully, for he doubtless can make money for you



Goodyear Conveyor Belt at the Claremont plant of the Union Rock Co., Los Angeles, California



Goodyear Suction Hose at work for the American Cyanamid Co., Brewster, Florida



Goodyear Cone Belts — made of cord — as specified by the G. T. M. for a New England textile mill

EVERY one of the thumbnail sketches on this page shows an actual installation of Goodyear Mechanical Rubber Goods that has saved the buyer money.

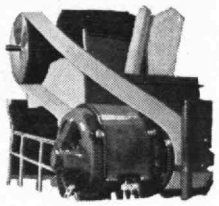
Every one of these installations, each typical of thousands of others, was made by the G.T.M.—Goodyear Technical Man—after an expert analysis of the job and its needs.

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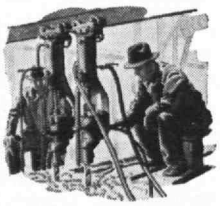
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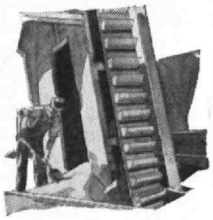
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Goodyear Thor Seamless Belt on a heavy machine drive



Goodyear Air Hose operating drills on a construction job in Texas

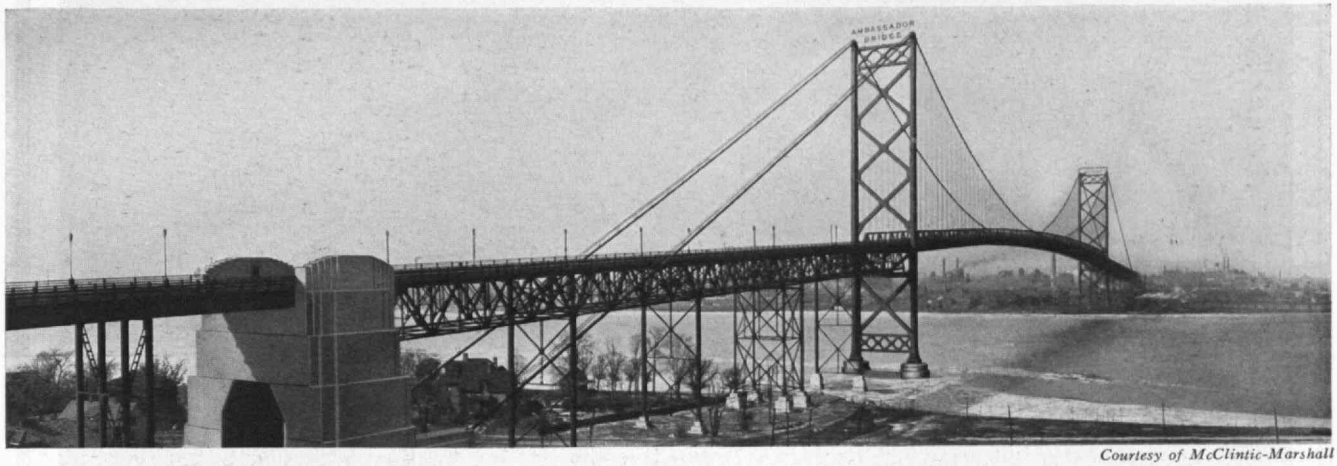


Goodyear Elevator Belting as applied by the G. T. M. to work in a Minnesota grain elevator

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Courtesy of McClintic-Marshall

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THE TECHNOLOGY REVIEW

Edited at the Massachusetts Institute of Technology

VOLUME XXXIII · · · NUMBER 4

Contents for January, 1931

DOWNTOWN NEW YORK FRONTISPIECE 178
The Camera Goes Impressionistic

MACHINE AGE POLITICS . BY CHARLES A. BEARD AND WILLIAM BEARD 179
The Technological Drive in Government

AN AMERICAN FARADAY BY KARL T. COMPTON 183
The Life and Achievements of Elihu Thomson

TREATING FOOD WITH LIGHT BY JOHN J. ROWLANDS 187
Ultraviolet Irradiation in Nutrition, Its Value and Limitations

THE TABULAR VIEW 170
Notes on Contributors and Contributions

THE TREND OF AFFAIRS 191
The Past Month in Science and Engineering

BOOKS 199
Review and Comment

THE INSTITUTE GAZETTE 200
Relating to the Massachusetts Institute of Technology

THE COVER *From a Water Color by* EDGAR I. WILLIAMS

EDITOR
J. RHYNE KILLIAN, JR.

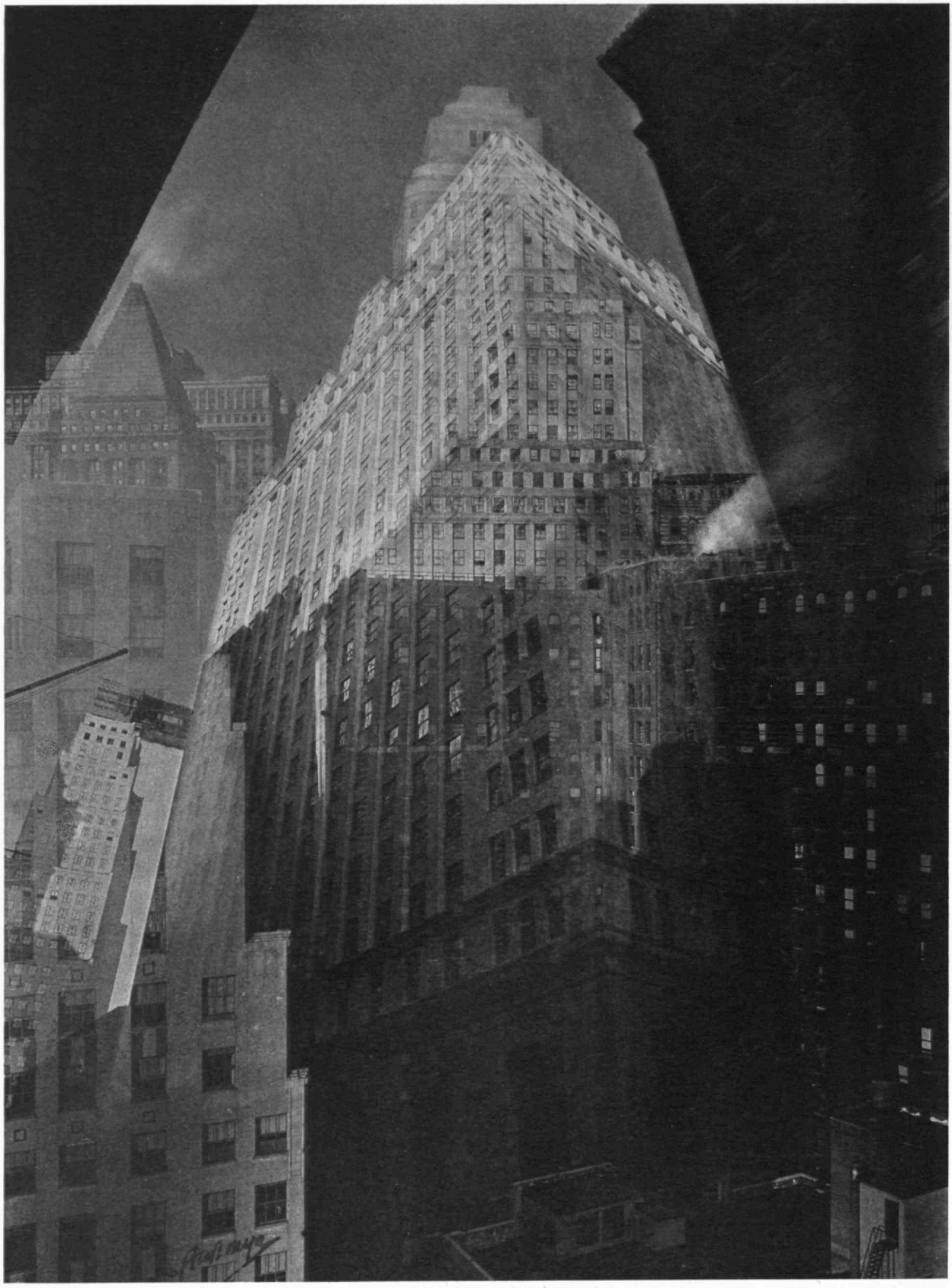
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THE CAMERA GOES IMPRESSIONISTIC

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VOLUME 33 JANUARY, 1931 NUMBER 4

MACHINE AGE POLITICS

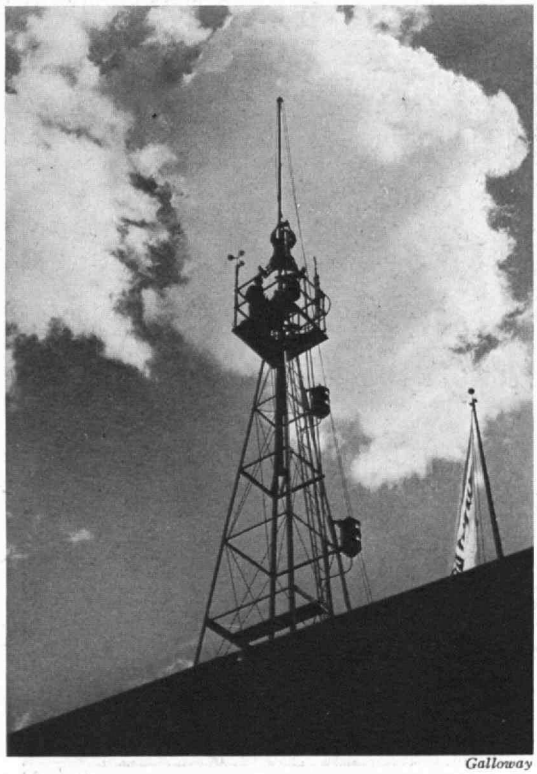
The Technological Drive in Government

BY CHARLES A. BEARD AND WILLIAM BEARD

WHILE the Ship of State sails majestically into the unknown waters of the future, many onlookers appraise her. Those with the loudest voices, it seems, are loath to divorce themselves from traditional views, however proudly they may boast of scientific disinterestedness in other matters. Consequently they see her through colored glasses. Noticing the continued prominence of such ancient devices as legislatures, councils, executives, cabinets, courts, juries, and bureaus, they conclude that the stanch old craft is just about the same as she was in sloop and clipper days. According to these commentators, she has been insulated from most of the changes so evident in other phases of human creation.

In truth, this is just one of the many myths current in our time. The very advances in science and machinery that have so markedly revamped the society in which we live have inevitably induced a parallel technological drive in government. Under the influence of this force the Ship of State is being renovated from stem to stern. She has new machinery aboard. Her sails are being replaced by powerful industrial engines — call them Capitalism, Communism, or what you will — and her inherited crew of spoilsmen is giving way all along the line to technicians. A little inspection of the facts in this amazing transformation soon shows why the Ship of State is no longer the fine old antique which some people imagine.

To drop the figure, the technological drive in government has enormously increased the duties discharged by the State in every direction, raising the number of employees from the thousands to the millions, drafting into service all the arts and sciences known to man and making use of all the materials listed under physics and chemistry. In many cases this extension is the result of realistic pressures exerted by groups formed around the new devices of technology themselves — the regulation of railways, telephones, telegraphs, cables, steamships, and electric power serving as an illustration. Again, other functions of State spring up in connection with discoveries and inventions because there is a growing consciousness of their possibilities for good — the promotion of safety and public health, for instance. Are not accumulating and expanding ideas as substantial as the dynamics with which engineers must reckon? Finally, numerous State activities are the product of technical circumstances so exigent as to be well nigh unavoidable. In the last category falls the supervision of wireless communication.



Galloway

WEATHER FORECASTING, AN EXAMPLE OF TECHNOLOGY IN GOVERNMENT

To enlarge upon this single phase, if a year must be chosen for its appearance, it may well be 1912 when the *Titanic* disaster fixed the attention of the governments of the world on the radio. A few weeks afterward, the civilized nations of the earth sought to provide, through international arrangement, for some kind of control over the new medium for telegraphy-without-wires, and the United States, in spite of its "isolation," had to join them in self interest. This gave the signal for increasing action. But has it

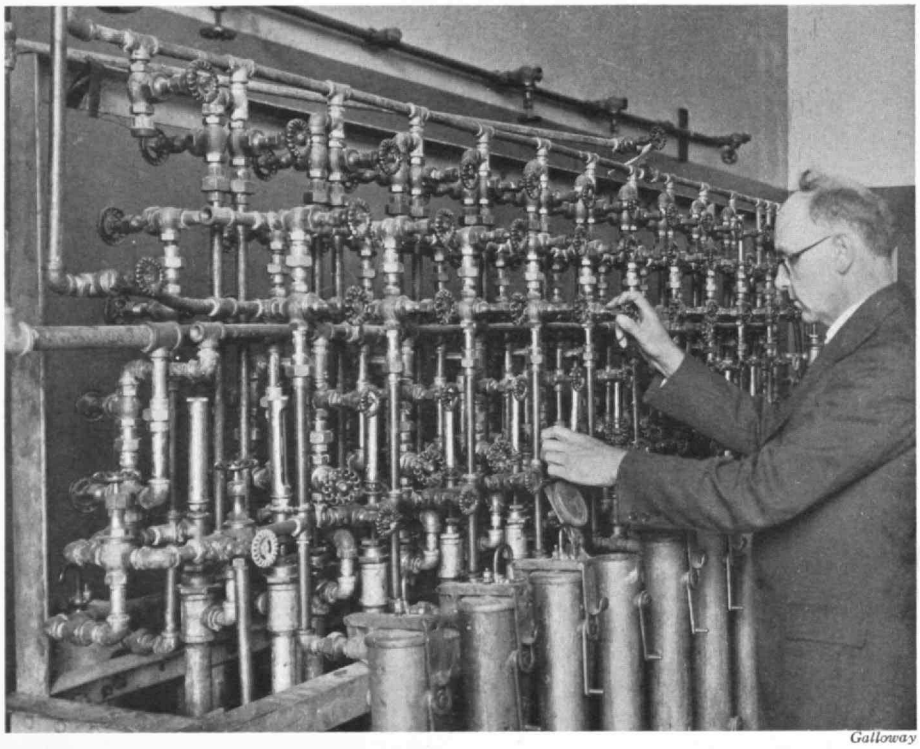
been really necessary for our Government to interfere in any way with private enterprise in this field — "necessary" somewhat in the sense in which that word is employed by engineers?

History offers illuminating evidence. In July, 1926, the Attorney-General of the United States ruled that our Secretary of Commerce, under existing acts, was without power to control broadcasting. Before long, as Commissioner Caldwell of the Federal Radio Commission pointed out, many stations "jumped without restraint to new wave lengths which suited them better, regardless of the interference they might be causing to other stations. . . . Stations were soon wildly blanketing each other while distracted listeners were assailed with scrambled programs. . . . Meanwhile 250 new stations had injected themselves into the already overcrowded situation and undertook to find perches on which to light . . . and heterodyne interference between broadcasters . . . became so bad at many points on the dial that the listener might suppose instead of a receiving set he had a peanut roaster with assorted whistles. Indeed, every human ingenuity and selfish impulse seemed to have been exerted to complicate the tangle in the ether." In 1927 federal regulation was resumed with highly beneficial results. Experience in two periods of anarchy — the first prior to 1912 during the infancy of the art, and the second after 14 years of orderly development — give testimony to the inescapable fact that the radio, a modern brain child, requires careful and constant government nursing. And so do a number of other technical devices of today.

Not only has technology added wholly new tasks, such as those just cited above, to the work of governments; it has also rendered far more burdensome the discharge of many very ancient functions. It has revolutionized the military and naval protection of the state, the taxation of property, and the supervision of weights and measures — all duties of ruling bodies from the dawn of civilization to the latest moment.

How technical progress has made its mark on old practices may best be indicated by a concrete case. The federal Constitution provides that Congress shall have power to fix the standards of weights and measures. When that famous document was written, its framers had in mind only the relatively simple matter of maintaining rough standards of length, mass, and volume. But the growth of science wrought substantial changes in the years that followed. For example, it has added many new units in electricity — the ohm, the volt, and the ampere. It has produced the candlepower as a measure of illumination, and the curie as a gauge of radio-activity. As if an expansion in the gross number of items were not enough, science has demanded measurements made with a precision never dreamed of in the Eighteenth Century. Today instruments can be calibrated to the nearest millionth of an inch by comparison with the apparatus of the Bureau of Standards. In another line of physics, that federal organization has developed a delicate device capable of responding to the heat radiated by a candle 100 miles away. The wide range of units employed in modern industry, therefore, and the astounding accuracy with which they must be determined, have entirely overhauled the original federal weights and measures administration, adding immense burdens to a once easy function.

UNDER the drive of technology some 40 federal bureaus and commissions primarily technical in character, outside of the War and Navy Departments, have been brought into being. In theory this mass of executive bodies is subject to the laws passed by Congress. But is Congress technically equipped to legislate on steamboat inspection, aviation, radio, geodetic surveying, and the like? Can it intelligently direct this huge organism, this administrative leviathan? In an age of specialization, is Congress really representative of the various trades, professions, and competence groups? An examination of the biographies of the 96 members of the more important branch of Congress, the Senate of the United States, throws light on the matter. As of January, 1930, over half of the Senators were listed as lawyers. Among the rest were one civil engineer, one mining expert, one physician, one well driller, and a scattering number of business, agricultural, and educational spokesmen, with four or five manufacturers. This being the case, the upper house is evidently not equipped with the specialized knowledge necessary to deal effectively with many matters of a technical nature that come before it. Nor is the House.

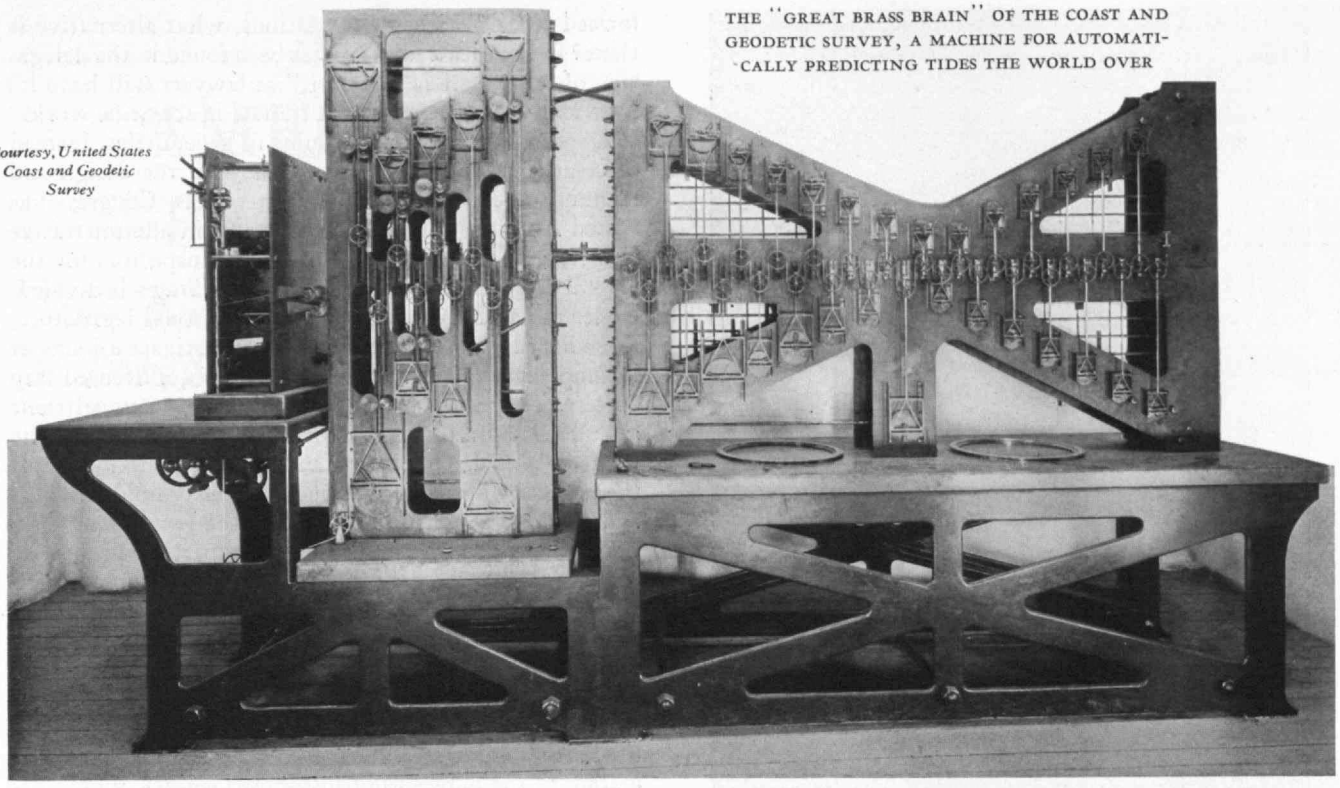


Galloway

DIFFUSION BATTERY IN SUGAR LABORATORY OF BUREAU OF STANDARDS, A SCIENTIFIC ENTERPRISE OF THE GOVERNMENT

THE "GREAT BRASS BRAIN" OF THE COAST AND GEODETIC SURVEY, A MACHINE FOR AUTOMATICALLY PREDICTING TIDES THE WORLD OVER

Courtesy, United States Coast and Geodetic Survey



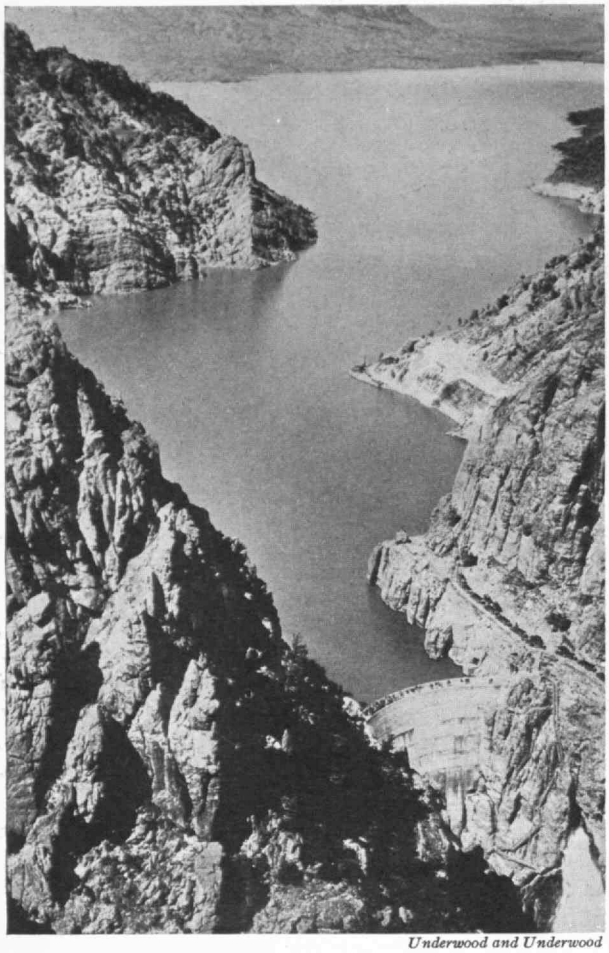
How, then, are the minute realities of government to be handled in the machine age? If legislatures are lay bodies while executive agencies, at least on the enforcement front, are technically competent, is it not inevitable that a large part of the burden of law-making must be shifted from the former to the latter? In practice, this is just what is happening in ever-widening areas of government. Congress is constantly enacting statutes in vague and general language, turning over to administrative officers the right and duty of filling in the details and giving technological substance to them.

The process is well illustrated by federal steamboat inspection. In a comprehensive act, Congress provided that a Board of Supervising Inspectors appointed by the President and Senate shall have power to adopt rules and regulations as to the design and equipment of all steam vessels subject to federal control. When approved by the Secretary of Commerce, the requirements of the Board have the force and effect of law. While Congress saw fit to set up a few guiding principles, it merely scratched the surface. For example, the statutes prescribe that "all such vessels shall comply with the following requirements, namely: that the boilers are well made, of good and suitable material; that the openings for the passage of water and steam, respectively, and all pipes and tubes exposed to heat, are of proper dimensions. . . ." But the Board of Supervising Inspectors must decide when a boiler is "well" made, when its materials are "good and suitable" and when openings and pipes are of "proper" dimensions. Such matters it has treated in four volumes, the one relating to ocean and coastwise vessels alone containing 297 pages of compulsory standards.

In effect, then, science and machinery have made such rigid demands for technical competence on the legislature that they have forced a definite and irreparable break in the boundary between the executive and law-making functions. Indeed no less an authority then Elihu Root has recognized this fact. In an address before the American Bar Association in 1916 he openly declared that "the old doctrine prohibiting the delegation of legislative power has virtually retired from the field and given up the fight . . . because [executive] agencies furnish protection . . . which under our new social and industrial conditions cannot be practically accomplished by the old and simple procedure of legislatures and courts as in the last generation."

UNFORTUNATELY there are times when Congress, in its anxiety to avoid details, passes general laws whose terms, though brief, are still technically well nigh impossible to follow. Thus the federal fund from which loans are made to shipping companies for construction work may be employed only in the aid of "vessels . . . fitted and equipped with the most modern, the most efficient, and the most economical engines, machinery, and commercial appliances." To the United States Shipping Board is lightly entrusted the interesting task of deciding what vessels are simultaneously the "most modern, most efficient, and the most economical." Since the "most modern" liners today must sacrifice economy to speed and since the maximum attainable efficiency often involves expensive equipment which may well prove uneconomical in a commercial sense, the law in this case is merely something with which to conjure. How the three qualities can be combined in one is certainly a poser. The laymen who enacted the bill did not have to accomplish the feat. They "passed the buck" to naval architects.

We have just pointed out some effects of technology on the executive and legislative branches of the government. It is equally important to illustrate the influences exerted



Underwood and Underwood

SHOSHONE DAM, ONE OF THE GREAT STRUCTURES BUILT BY THE U. S. RECLAMATION SERVICE

by science and machinery on the judicial branch. First of all they have greatly multiplied and diversified the business before the courts and in some instances forced the establishment of special tribunals to hear new types of cases. The coming of the motor vehicle, for example, has placed 25,000,000 mobile units on our highways and brought about complicated traffic regulations. The results are known to everyone. Violations of parking rules, passing signal lights, speeding, and similar acts make for many arrests. If such matters are handled in the regular courts, congestion, lack of uniformity, and the wholesale dismissal of charges without hearings, to clear the dockets, are apt to result. To meet the situation, many large centers have created special "traffic courts" exclusively for the hearing of motor vehicle cases. Indeed, the *American City* of June, 1929, estimates that such specialization might often be necessary in towns with a population as little as 15,000.

But the movement towards the establishment of special courts is slow — perhaps because the law is the most traditional of our professions. Despite repeated attempts to secure a separate patent tribunal, Congress has refused to do more than separate patents from the general run and combine them with the customs under a single jurisdiction. What, then, are we to do to insure technical competence in trials involving violations of steamboat inspection rules, air traffic regulations, and the like, when judges remain men of all work? If "courts" cannot be formed to deal with such questions, what alternative is there? In practice a solution has been found in the delegation of many judicial ("quasi," as lawyers will have it) functions to executive bodies trained in scientific work.

A specific case is worth a mine of generalities. Instead of creating a special court to deal with the design and manning of modern power-driven vessels, Congress has vested a certain judicial responsibility in administrative agencies — local boards of steamboat inspectors for the several districts into which the United States is divided. Under the authority granted by the national legislature, these boards, among other things, investigate all acts of incompetency and misconduct on the part of licensed ship officers. They may summon witnesses and compel their attendance by a process similar to that employed in the United States district courts and they may administer all the necessary oaths to the same. They may hold hearings and examine the witnesses, and, if the revelations warrant, revoke the licenses of the guilty parties. In view of the fact that such revocation throws the accused person out of a skilled job, this act is most certainly a serious type of punishment, akin to a fine or other penalty imposed by a regular tribunal. Nor is the mimicry of the judiciary yet complete; a system of appeals is provided. In case the defendant is dissatisfied with the decision of the local board of steamboat inspectors, he may carry the matter to the Supervising Inspector General, whose determination shall be final when approved by his chief — the Secretary of Commerce. Furthermore, in these appeals the accused shall have the right to be represented by counsel and to testify in his own behalf.

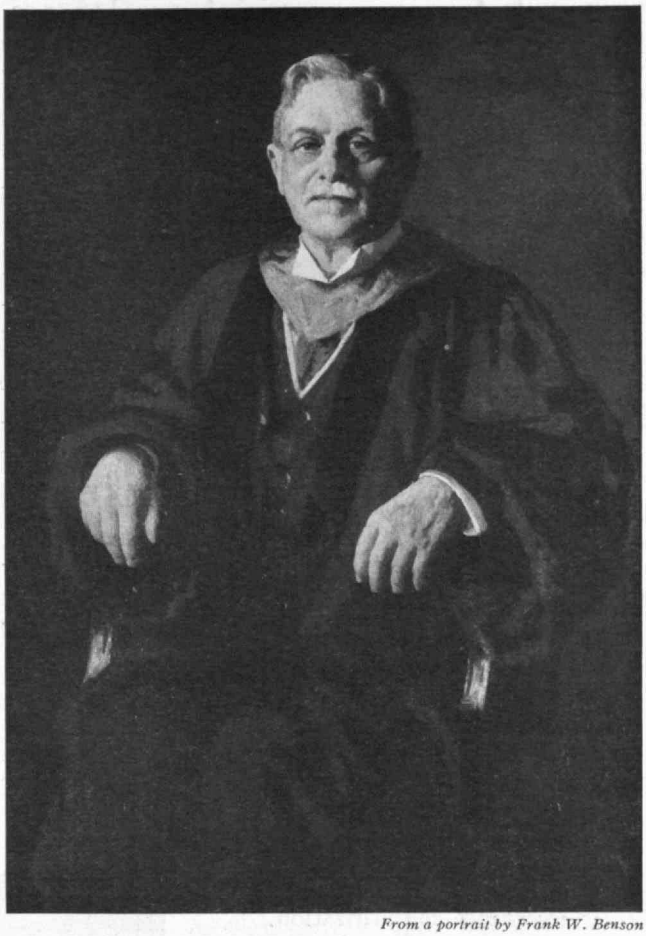
TURNING from a discussion of the technological drive in the executive, legislative, and judicial branches to certain larger aspects of government, the influence of science and machinery is again found at work. For one thing, it has revolutionized our concepts of the size of an efficient State. Aristotle, in his *Politics*, declared that "a state when composed of . . . too many [people,] though self-sufficing in all mere necessaries, . . . is . . . almost incapable of constitutional government. For who can be the general of such a vast multitude, or who the herald, unless he have the voice of a Stentor?" Although Stentor, as a herald in the Trojan war, had a famous throat, he could only reach a few thousand auditors at a time. By Greek standards the United States, with over a hundred million people, could only be a clumsy monstrosity.

Until the radio age Aristotle's judgment seemed to have warrant. As our population grew at a phenomenal rate, the distance between the national executive and the man-in-the-street widened to correspond. True, heroic efforts were made by presidential nominees to reach the people but they produced feeble results at best. The most famous attempt, perhaps, was that of William Jennings Bryan who conducted a 14-week pre-election campaign in 1896, during which he traveled some 18,000 miles, delivered 600 speeches, and managed to get 5,000,000 souls within the sound of his voice. Human toil could scarcely do more; still the traveling statesman failed to reach whole sections of the country. And it is significant that with the growth of population political statistics recorded a declining public interest. (*Continued on page 204*)

AN AMERICAN FARADAY

More than Any Man Now Living, or Perhaps That Ever Lived, Elihu Thomson Combines the Constructive Powers of the Inventor, the Thoroughness of the Scientist, the Balance of the Philosopher

By Karl T. Compton

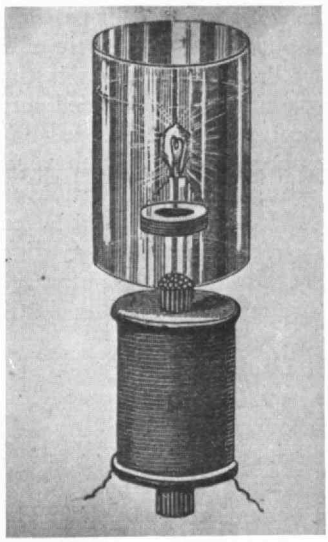


From a portrait by Frank W. Benson

PROFESSOR ELIHU THOMSON

AT THE age of 11, being too young to enter high school, Elihu Thomson obtained several boys' books on scientific and mechanical subjects, and inspired by these, proceeded to construct for his own amusement a variety of the electrical devices which were the absorbing scientific interest of that day, such as batteries, Leyden Jars, electromagnets, and telegraphic instruments. He constructed a frictional static machine out of an old wine bottle and when his father did not seem sufficiently impressed by the tiny sparks it produced, he went to work and constructed a large static battery which he demonstrated to his father so effectively as to lay him almost out.

This interest and genius, already evident at the age of 11, has been equally evident throughout the long and wonderfully active career of Professor Thomson. Because of this he has been aptly called "the dean of electrical engineers". He is the holder of more than 700 U. S. patents, which is the third largest number held by any living man. He is honored and respected by every scientific, engineering, and educational institution in the world (from 1921–1924 he was Acting President of M. I. T. and at present he is on its Corporation and a non-resident member of its Faculty), and in Lynn, Mass., he is more than any other man responsible for the great electrical industry which supports thousands of people there. Commenting recently on Professor Thomson's contributions to the General Electric Company, Owen D. Young recently summed up the assets of the Company as $500,000,000, and with shares valued at $2,000,000,000. The difference in value between $2,000,000,000 and $500,000,000, said Mr. Young, is in a substantial part due to the ideas, inventions, and spirit which this Company owes to Professor Thomson. It is seldom if ever, that a man lives to see such a remarkable and tangible result of his life's work.



THOMSON REPULSION EXPERIMENT SHOWING ARC INCANDESCENT LAMP ATTACHED TO THE TERMINALS OF A COIL OF WIRE AND THE COIL AND LAMP FLOATED IN WATER ABOVE AN A.C. MAGNETIC FIELD POLE WHICH LIGHTS THE LAMP AND REPELS THE COIL TO DEFINITE CURRENT VALUE IN LAMP. FORERUNNER OF A.C. CONSTANT CURRENT TRANSFORMER

Although his interests have been effectively employed in many lines, it is in the field of electricity that his genius has found its greatest scope and has led to the most important achievements and widespread service. It would be utterly impossible even to mention most of these discoveries, but I shall pick out just a few of those which have been outstanding. Perhaps the first great contribution was the invention in about 1879 of the three coil arc dynamo with its automatic regulator and other features, which formed the basis of the first successful electric lighting system, which was put out by the Thomson-Houston Company in 1880, and which quickly found its place not only in this country but also in the leading countries of Europe. The machine was entirely automatic in its operation and so adjusted that it could maintain constant regulation in a system of many electric arcs, no difference how many of these arcs



EARLY MODEL OF THOMSON CONSTANT CURRENT TRANSFORMER

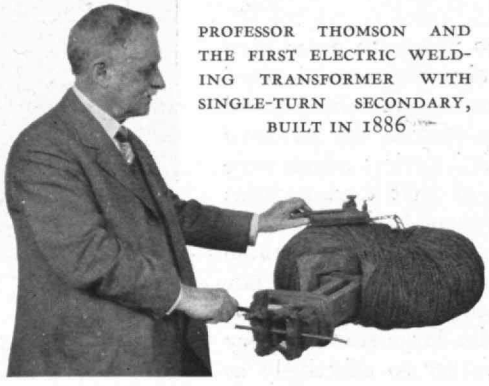
might be turned off or on. The need for such a regulator and its general nature were suggested to him by his earliest serious electrical studies, which were on the relation between the current and voltage in an electric arc, and which led him to the discovery that as the current increases the voltage falls — a relation which accounted for instability and pointed out characteristics which an arc dynamo should have.

It is interesting to note that this three coil dynamo was a direct current machine provided with a commutator, since in those days direct currents were more readily handled than were alternating currents and had certain advantages for arc lighting purposes. However, exactly the same machine, simply with different connections, constitutes the three phase generator which is so important in present day electric power and was so represented in the original patent application. This is one of many cases in which Professor Thomson's ideas were years in advance of the world's readiness for their acceptance and utilization.

About two years later (1881) there was another great invention, that of a magnetically operated lightning arrester. Although this was designed for the particular purpose of protecting his arc light systems from lightning, it was the invention of a fundamental method of breaking electric circuits, which has found very numerous applications, one of the most important of which was by Professor Thomson himself in the control of electric cars and trains.

The fundamental idea of this was again based upon an accurate knowledge and study of scientific phenomena involved in the discharge of electricity through gases. A transmission line, of course, has to be insulated from the earth by insulators adequate to prevent spark-over at the voltages used. If, however, the line is struck by lightning or an abnormally large electric surge passes through it, a spark may pass around the insulation, and it is a peculiarity of sparks through air that when once the insulation of the air is broken down by a spark there is literally no limit to the amount of current which can flow. Thus these sparks frequently cause serious short circuits.

Professor Thomson's discovery consisted in placing the insulator between the poles of a magnet, with the result that the spark or arc which might be produced was acted on by electrical forces in such a way as to elongate it in the form of a bow which became more and more extended until it finally became so long that it went out. This principle is of just as great importance today as ever and is the foundation of many recently improved schemes for the switching of very large currents.

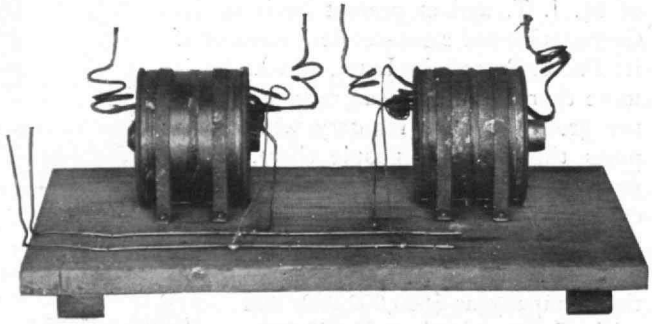


PROFESSOR THOMSON AND THE FIRST ELECTRIC WELDING TRANSFORMER WITH SINGLE-TURN SECONDARY, BUILT IN 1886

Again in these very early days and long before the importance of it was realized, Thomson invented the now universally used method of transmitting electric power, stepping it down from a high tension with the aid of a local transformer for consumption. This was set up as a working model at the Franklin Institute in Philadelphia in 1879, a patent was applied for in 1885, and after an unusually strenuous history in the patent office, the fundamental patent for multiple arc distribution systems with transformers was granted in 1902. During this same time and as an additional safety device for high voltage operation, Thomson patented the procedure of earthing the secondary coil of the transformer, a practice which has now become universal. In passing I should note here as an illustration of a notable characteristic of Professor Thomson, that this patent on his advice was dedicated by the General Electric Company to the public from a feeling that no patent or invention which has to do with public safety should in any way be restricted or made unavailable to the people.

In the further development of alternating current machinery he invented the constant current transformer and the inductive regulator in which a movable secondary or primary coil could be adjusted to give constant current output. Again in the direction of increasing the power capacity of transformers, in 1887–89 he first proposed the use of oil for cooling and for insulation purposes in transformers, and furthermore called attention to the great and deleterious effect of moisture in the oil, an effect whose full significance students of insulators are only now beginning adequately to realize.

I pass now to two of the most important and characteristic of Professor Thomson's discoveries. The first of these is that process of electrical welding whereby the welded surfaces were fused and united by the heat developed on account of the resistance in the contact between them. This method of welding has come into enormous use in industry and the indications are that it will be even more used in the near future. As examples in widely different fields may be mentioned the welding of seamless metal tubing, the attachment of filaments and other electrodes in incandescent lamps and vacuum tubes,

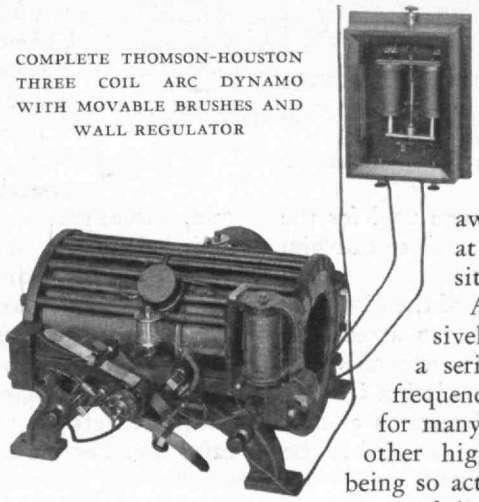


EXPERIMENTAL PAIR OF TRANSFORMERS AS USED AT THE FRANKLIN INSTITUTE, PHILADELPHIA, JANUARY AND FEBRUARY, 1879, IN PIONEER A.C. TRIALS

and the fastening together of most of the parts of the new Ford automobile. In the former of these applications it may be interesting to know that a single manufacturer had manufactured, a few years ago, about 24,000 miles of bedstead tubing by this process in a single year.

Professor Thomson was not the first to utilize an arc in welding. There was some previous art, such as Slavianoff and DeMeritens, but the Demeritens patent, which was fundamental, was bought on advice of Professor Thomson by the Thomson Electric Welding Company in the early days, and had arc welding developed within the life of the patent, that company would have controlled the arc as well as the electric resistance welding art.

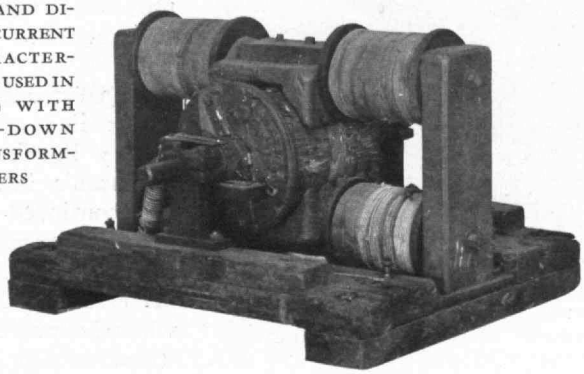
Again, one of Professor Thomson's most fundamental discoveries was the principle of dynamical repulsion between a primary and secondary coil. This can be demonstrated by a variety of interesting lecture experiments, most of which were suggested and shown first by Professor Thomson himself (see page 183). One of these is an experiment which invariably arouses cheers in our freshman classes. A vertical wire core is surrounded by a spool of wire through which a large current can be passed upon throwing a switch. A metal ring which slips easily over this core is dropped around it from above. Immediately upon closing the circuit this ring is shot up into the air by the repulsive action by the electric current produced in the ring and the primary current in the coil. This scientific observation was developed by Professor Thomson into an alternating current repulsion motor which is nothing more nor less than our ordinary induction motor, which is in almost universal use for small single phase motors.



COMPLETE THOMSON-HOUSTON THREE COIL ARC DYNAMO WITH MOVABLE BRUSHES AND WALL REGULATOR

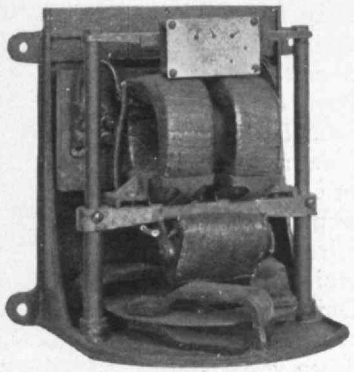
In connection with this discovery you will be interested in the following quotation from the *Electrical World* of May 28, 1887 commenting upon this work:

"It is, as yet, too early to assign to its proper place and limit the part which the alternating current will take in the electric arts. It has started on its career with most rapid strides, and it now only remains to devise means for its accurate measurement, regulation, and distribution.



EARLY BI-PHASE MACHINE MADE IN 1878 HAVING BOTH ALTERNATING AND DIRECTCURRENT CHARACTERISTICS USED IN 1879 WITH STEP-DOWN TRANSFORMERS

Certain it is that Professor Thomson's brilliant paper cannot fail to act as a powerful stimulus to those whose attention is now absorbed in the direction indicated, and the fruits of which will soon be noted. We hope that at a later meeting of the Institute Professor Thomson will give to the world his practical results, which he has only hinted at in the present paper." These practical results are now seen, for example, in probably a million induction motors in daily use.



THOMSON RECORDING WATTMETER OF THE TYPE WHICH TOOK THE PARIS PRIZE OF 1890

During the years 1885–1895 Professor Thomson was busily engaged with the development of electric meters of which more than 4,000,000 are now in operation. It is these meters which tell you and the public service corporation the amount of your monthly electric bill, and for this invention Professor Thomson was awarded the Paris Meter Prize of 1890 at a competition held after the exposition of 1889.

As early as 1890 and continued intensively for half a dozen years thereafter were a series of brilliant experiments on high frequency alternating currents, paving the way for many of the developments in wireless and other high frequency applications which are being so actively applied at the present time. He constructed the first high frequency dynamo, operating at frequencies of 30–40 times as great as any previously designed, and in connection with experiments with this type of electric power he designed also the first special high frequency transformers. While working in this field he discovered a method of producing still higher frequency alternating current from a direct current arc, by shunting the arc with inductance and capacity, thus discovering the method which played such an important rôle in wireless transmission up until its virtual replacement by electronic tube devices only within the past few years. This interesting method of producing alternating currents was actually applied to wireless telegraphy by Poulsen, and is therefore generally known as the Poulsen arc. Also in connection with these high frequency investigations, he made the important discovery that the insulating power of oils at these high frequencies is very much greater than at the ordinary low commercial frequencies, if this insulating power is measured in terms of the path at which a spark will pass. Just one other item can be mentioned in connection with his high frequency work, namely, the fact that he discovered and was the first to use the method of tuning electric circuits, which is, of course, absolutely fundamental to modern electrical communication systems. This was done very

early in his career while he was still a professor at the Boys' Central High School in Philadelphia, and was done in connection with experiments on wireless signaling which antedate the famous experiments of Hertz by about a dozen years, and as far as I have been able to ascertain constitute the first experiments on the propagation of electric waves and wireless signaling, with the sole exception of some experiments conducted still a dozen years previous to his by Joseph Henry in Princeton. These earlier experiments of Henry's were apparently never published but were used for the very practical purpose of allowing his wife to call him when his meals were ready.

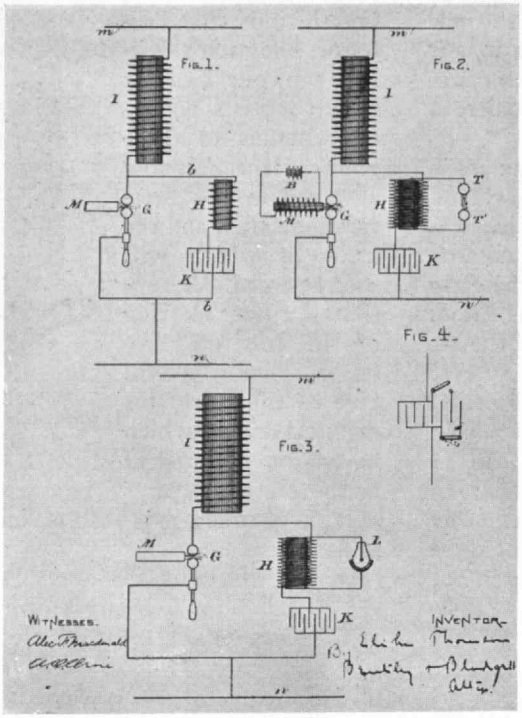


DIAGRAM OF THOMSON METHOD FOR OBTAINING A.C. CURRENT OF A WIDE RANGE OF FREQUENCY FROM D.C. SUPPLY

Immediately upon the announcement of the discovery of Röntgen rays Professor Thomson began a series of interesting experiments and valuable developments in connection with the x-ray art. The foundation for this work had been laid by previous experiments on electric discharge through gases at low pressures, and led to the first application of stereoscopic methods in Röntgenology only one year after the publication of the Röntgen rays themselves had been announced, and led also to various practical improvements in the design of x-ray tubes, as for example, the double focus x-ray tube and a cooled target tube within less than a year after the discovery of Röntgen rays. In connection with these experiments Professor Thomson also took a lively interest in the physiological effects of x-rays including x-ray burns, and in the laws governing diffusion in x-ray matter, subjects which have been developed on the one hand to exceedingly important applications in medical therapy, and on the other hand to give some of the most intimate knowledge which we possess of the internal constitution of matter, such as the arrangement of atoms in crystals and molecules, and the arrangement of electrons in atoms.

PROFESSOR THOMSON has not confined his activity exclusively to electrical science. Jointly with his first colleague, Houston, he invented and patented the continuous centrifugal cream separator in the years 1877–1881. This was a device applicable to the separation of substances of different densities and has come into universal use in the cream industry, as well as in the laboratory and elsewhere, for centrifuging mixtures which it is desired to separate. A typical claim in this patent is this: "a process of creaming milk mechanically, skimming off the cream mechanically, and removing the skimmed milk mechanically, by centrifugal force." At that time Professor Thomson could not have dreamed that this same process of separating materials by centrifugal force would later be used by a brilliant young physical chemist of the Institute of Technology for separating the molecular ions of electrolytes and obtaining their relative weights.

In the field of steam engineering Professor Thomson in 1899 produced a steam engine of remarkable efficiency which is now generally known as the "uniflow" engine. He described the principle on which this engine was based in the following words:

"The conditions are such that there is no re-traversing of passages, no re-traversing of even the cylinder portion. The steam enters, goes forward and out, keeps running steadily forward, so that we do not have any of those inter-actions that use up energy. We have a temperature gradient from one end to the other of steam cylinder."

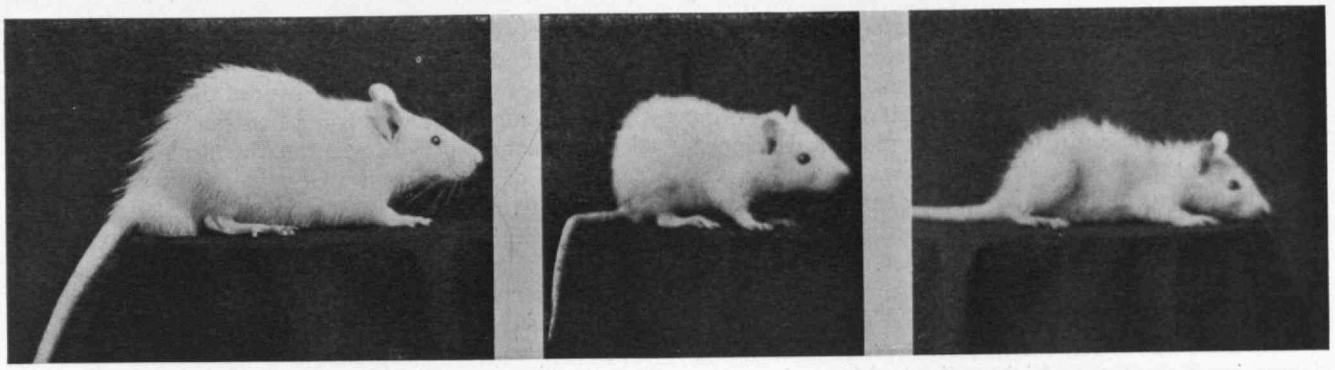
Again in 1894 he devised a muffler for automobiles antedating the Maxim silencer and in many respects similar in principle. This muffler was based upon a sound scientific principle of dividing up an impulse or sound wave so that it should traverse a number of paths of unequal length, so that when these divided impulses all came together again, they should be out of phase and partially neutralize each other so as to take away or spread out the shock of the initial impulse. I can only mention further in the field of automotive engineering that Professor Thomson devised numerous types of gas and oil engines or improvements in their construction.



PROFESSOR THOMSON INSPECTING FUSED QUARTZ ASTRONOMICAL MIRROR — ONE OF HIS EXPERIMENTS LEADING TOWARD THE CONSTRUCTION OF A 200-INCH MIRROR

IN QUITE a different line of activity Professor Thomson's interest has continued unabated from the time quite early in his career in 1878, when he published

(*Cont. on page 210*)



THE RESULT OF AN EXPERIMENT CONDUCTED FOR THE REVIEW BY R. S. HARRIS OF THE INSTITUTE'S DEPARTMENT OF BIOLOGY AND PUBLIC HEALTH. AT THE BEGINNING OF THE TEST THESE RATS EACH WEIGHED 51 GRAMS, WERE 30 DAYS OLD, AND WERE TAKEN FROM THE SAME LITTER. THE RAT ON THE LEFT WAS FED A DIET RICH IN VITAMIN D FOR 24 DAYS. HE SHOWS NORMAL GROWTH. THE RAT IN THE CENTER WAS FED A DIET CONTAINING NO VITAMIN D FOR 24 DAYS. HE HAS SEVERE RICKETS AND GAINED BUT 9 GRAMS DURING THE TEST. NOTE THE SHORTENED NOSE AND BODY. THE RAT ON THE RIGHT WAS FED THE STEENBOCK DIET (CONTAINING NO VITAMIN D) BUT IN ADDITION HE RECEIVED IN ISOLATED DOSES 10 UNITS OF VITAMIN D DAILY, OR 10 TIMES WHAT HE NEEDED. WHILE HE DID NOT GET RICKETS AS DID THE CENTER RAT, HE GAINED BUT 8 GRAMS AND THE WETTED APPEARANCE OF HIS FUR, A SIGN OF ABNORMAL ORGANIC FUNCTIONING, INDICATES THAT TOO MUCH VITAMIN D MAY BE HARMFUL

TREATING FOOD WITH LIGHT

Ultraviolet Irradiation in Nutrition, Its Value and Limitations

By John J. Rowlands

UNTIL 1801 man did not know that ultraviolet light existed. Since its discovery at that time by Johann Wilhelm Ritter (1776–1810), an amazing variety of chemical and physiological effects deriving from it have been demonstrated. In fact life has been shown to be dependent upon ultraviolet and illness to be amenable to its therapeutic effects.

These things being known, it was natural that scientists should set about to devise means for producing it artificially and methods for making it available in ways more manifold than exposure to sunlight. During the last decade a multiplicity of sunlights have been contrived, some good, others worthless, to emit ultraviolet, and commercial interests with more high pressure than science, have brought the public into the picture by marketing these artificial sources for indiscriminate use.

In the meantime, working deliberately and carefully from another angle, the physicists and biochemists began discovering strange but richly profitable facts about the relation between ultraviolet light and vitamin D, that "accessory food factor" which prevents and cures rickets, the scourge of babies. Sir Frederick Gowland Hopkins, as far back as 1912, demonstrated the presence and need of these accessory food factors, later to be called vitamins. The subsequent relating of ultraviolet light to one of the most important of these was a capital achievement for the biochemist. It has brought about the irradiation of foods with ultraviolet light, a development more important than quick freezing which is just coming of age, and the many other improvements devised by scientists for treating, handling, and improving the world's food.

Before describing the important advances lately made in food irradiation, a precautionary word is appropriate. If ultraviolet lamps can be exploited by some manufacturers and misused by the public, then it is probable that food treated by ultraviolet light is susceptible to even graver abuses. Up until the present time, the evolutionary process from laboratory to commercial production has been singularly conservative and practically beyond criticism, but already there are indications of an ill wind. The public is becoming "vitamin-minded" and because American "mindedness" on any subject is prone to expand into that wild-fire type of mass enthusiasm from which intemperate fads spring, authorities feel that until more is known of the nature and specific effects of this powerful agent, the development of a national appetite for substances rich in vitamin D would be unwise (see above illustrations). Ultraviolet light is of incalculable value when properly used and quacks should not be permitted to exploit it as the modern patent medicine.

IN ORDER to understand clearly the significance of the therapeutic application of ultraviolet light, it is necessary to review briefly the advance of knowledge in this field in the past few years. What has been accomplished has sprung chiefly from developments that had their beginnings in 1919 and 1920. The first was the discovery that bone development could be controlled by diet, a fact demonstrated for the reader by an illustration upon which the accompanying illustrations are based. The second was that light also can control bone development.

The results of a painstaking study of the various steps that led to the application of light to food substances, with much valuable information on the present methods in this new field of nutrition have recently been published by Katharine Blunt, '03, President of Connecti-

cut College, and Ruth Cowan, Instructor in the Department of Home Economics of the University of Chicago.

It was Dr. E. Mellanby, an Englishman, who in 1919 reported the results of important nutrition experiments on puppies. Fed on a limited diet, these puppies developed rickets with the characteristic soft bones and bowed legs found in rachitic children. By feeding them cod liver oil he succeeded in curing some of the animals, and established the fact that rickets is a disease caused by a deficiency in diet. Mellanby, however, was unable to determine the nature of the deficiency. The fats, cod liver oil, and butter, which he found most potent in treating rickets, were the same which earlier had been shown to contain the growth-promoting vitamin A, and he concluded that in this vitamin lay the secret of the cure.

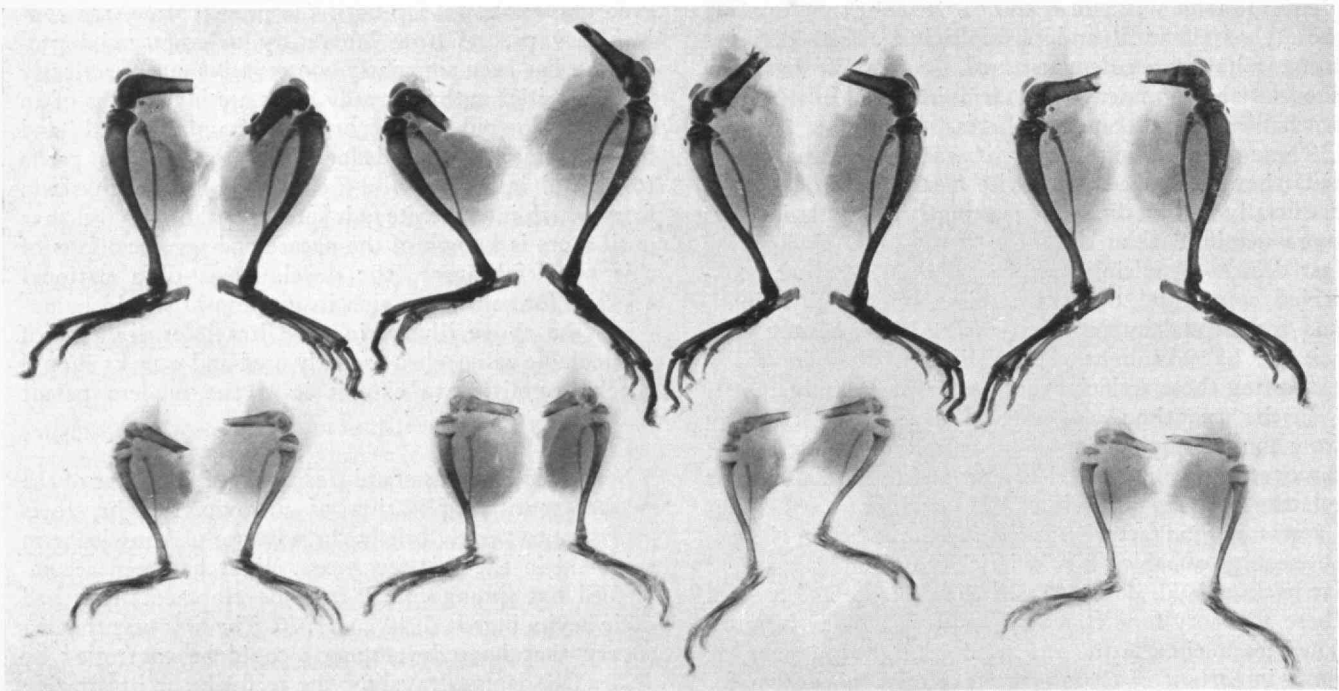
Meantime Dr. Alfred F. Hess of New York, studying a group of babies, discovered that some of his small charges living on a diet rich in milk and cream in which the vitamin A is found, were subject to rickets more readily than a group whose diet was low in vitamin A. Here was evidence indicating that vitamin A alone did not cure rickets.

It was two years after Mellanby had reported his work on puppies that E. V. McCullum and a group of workers at Johns Hopkins University established the fact that the "mysterious something" in cod liver oil that cures rickets was not vitamin A. They found that cod liver oil in which the vitamin A had been destroyed still had the power to cure rickets in their laboratory rats. Their work brought recognition of the existence of the antirachitic factor which has come to be known as vitamin D, and immediately focussed scientific interest upon that ancient remedy of the fishermen of England, Holland, and France, the repellent oil of the liver of the lowly cod fish.

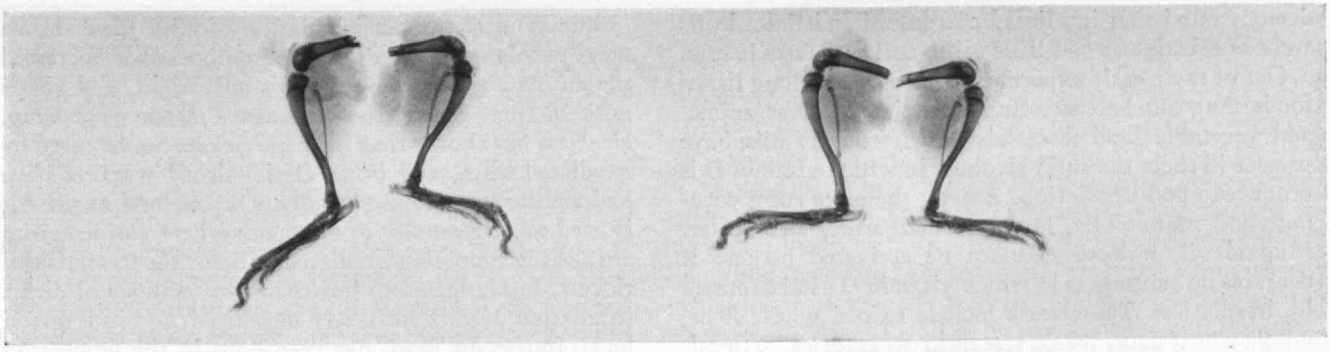
The second discovery that has had much to do with the development of knowledge in the treatment of rickets was the result of the work of a German scientist, K. Huldschinsky, in Berlin in 1919 and 1920, just after the end of the World War. In the Oscar-Helene Home for Crippled Children he found tragic conditions, for a great many of the children from three to five years old were suffering from rickets, some with marked deformities of the legs, while others showed spinal curvatures. Then began the experiments in which he was to discover that mysterious radiations from the mercury quartz lamp and from natural sunlight had the power to promote rapid cure of rickets. He found, however, that these radiations could not cure the worst deformities, and he at once turned to preventative treatment by irradiation. Working in New York, Dr. Hess in 1921 also found that natural sunlight by itself would cure rickets in infants.

These discoveries — the fact that rickets could be controlled by diet, and that light also had the power to cure the disease — could not be reconciled at that time, for there seemed to be no relation whatsoever between cod liver oil and radiant energy from the sun and certain artificial sources of light.

THE answer to this scientific riddle came in 1924. Dr. Hess of New York, and Dr. Harry Steenbock of the University of Wisconsin, working independently, dis-



TOP ROW: X-RAY PHOTOGRAPH OF THE REAR LEGS OF FOUR RATS FED A DIET IDENTICAL WITH THE RAT SHOWN ON THE LEFT ON PAGE 187. NOTE THE LARGER SIZE IN BONES AND THE DARKNESS OF THE PRINT WHICH IS DUE TO THE LARGE AMOUNT OF CALCIUM IN THE BONE DEPOSITED BECAUSE OF SUFFICIENT VITAMIN D IN THE DIET. NOTE ESPECIALLY THE SMALL SPACE BETWEEN THE SHANK BONE AND THE CAP BONE WHICH FORMS THE KNEE JOINT. BOTTOM ROW: THESE ARE LEGS FROM RATS THAT RECEIVED A DIET FREE OF VITAMIN D WHICH THE RAT SHOWN IN THE CENTER ON PAGE 187 RECEIVED. NOTE HOW SMALL THE BONES ARE, HOW LITTLE CALCIUM THERE IS PRESENT. IN THE FIRST LEG IN THE ROW NOTE THE WIDE BAND WHICH CONNECTS THE SHANK BONE WITH THE CAP BONE. THIS BAND IS CARTILAGE, NOT BONE, AND WHEN THERE IS SUFFICIENT VITAMIN D AS IN THE TOP ROW THE BAND IS VERY NARROW. WHEN DIET IS DEFICIENT IN VITAMIN D THE BONE DEGENERATES AND CARTILAGE TAKES ITS PLACE. CARTILAGE IS PLIABLE AND UNABLE TO STAND WEIGHT WITHOUT BENDING WHICH EXPLAINS WHY CHILDREN WITH RICKETS BECOME BOW-LEGGED OR DEFORMED



LEG BONES OF RATS THAT RECEIVED THE DIET GIVEN TO THE RAT ON THE RIGHT SHOWN ON PAGE 187. THESE RATS RECEIVED A GREAT EXCESS OF VITAMIN D AND THEIR BONES ARE DARKER THAN THOSE SHOWN IN THE BOTTOM ROW, PAGE 188, BUT NOT AS DARK AS THOSE SHOWN IN THE TOP ROW. THIS SHOWS THAT ALTHOUGH THE VITAMIN WAS PRESENT IT WAS NOT UTILIZABLE BECAUSE OF THE DELETERIOUS EFFECTS PRODUCED BY THE LARGE EXCESS. THE CARTILAGE BAND IS NARROW AND DENOTES ABSENCE OF RICKETS. THE SMALLNESS OF THE BONES, THE DEFICIENCY IN CALCIUM DEPOSITS, AND THE FACT THAT TWO OF THE FOUR RATS PUT ON THE DIET DIED, ARE CONCLUSIVE EVIDENCE THAT EXCESS VITAMIN D HAS ITS PERILS

covered simultaneously that when irradiated with ultraviolet light certain foods developed the potent antirachitic characteristics, the power to cure rickets. Their discovery means that ultraviolet light by some unknown chemical reaction causes the formation of vitamin D in substances in which the antirachitic factor does not exist before irradiation. And, furthermore, it means that proper administration of these irradiated substances encourages normal bone development with the desired formation of calcium and phosphorus, the lack of which is the outstanding characteristic of rickets.

Present knowledge indicates that the distribution of vitamin D in the natural state is comparatively limited. The known natural sources are animal and fish livers, egg yolk, and in a lesser degree butter fat. The liver is the natural storehouse for the vitamins A and D. These facts indicate the importance of the synthetic formation of the antirachitic factor in foods.

The work of Hess and Steenbock at once solved a scientific mystery and opened the door to a new and fertile field for research in nutrition and medicine. Investigations growing out of their work have shown that many foods can be successfully irradiated and experiments on animals and children suffering from rickets have indicated their power to cure. It has also been found that the vitamin content of a food substance lies in the small amount of unsaponifiable solid alcohol which it contains, and that vitamin D is formed by irradiation of this alcohol by ultraviolet light. Most foods containing fat also contain these alcohols, but the vitamin is present only in the alcohol and not in the fatty portion.

Of all the important developments in biochemistry in recent years, none is more striking than the discovery that the sterols, or solid alcohols, are peculiarly adapted for the synthetic formation of vitamin D by ultraviolet irradiation. One of these sterols known as ergosterol has been found to be most susceptible to the effects of radiant energy. Out of this discovery has come the theory that the antirachitic effect produced in man and animals by exposure to ultraviolet light is caused by the formation of vitamin D in or from the natural ergosterol present beneath the skin.

As a result of these discoveries, ergosterol, first derived from ergot, but now obtained chiefly from yeast, is available in irradiated form for medicinal use. Properly irradiated ergosterol is very much more potent in vitamin D than cod liver oil, and is already being widely used by the medical profession in the prevention and treatment of rickets. The commercial form of irradiated ergosterol is called viosterol, a name authorized by the Council on Pharmacy and Chemistry of the American Medical Association. Irradiated ergosterol, it may be noted, does not contain vitamin A, and because of certain dangers attendant upon its unrestricted use, the substance should be administered only by those with a special knowledge of its effects.

RECENTLY there was established in Arizona a remarkable laboratory for the production of irradiated ergosterol by the radiant energy of natural sunlight. A location high in the mountains of Arizona was chosen because the atmosphere in that region is particularly rare, permitting an unusually large amount of ultraviolet rays to penetrate to the earth. The ultraviolet rays of natural sunlight are utilized in this unique laboratory by means of large parabolic reflectors in which the available light is concentrated at the focal point. Ergosterol dissolved in ether courses through this focal point in quartz tubes during the process of irradiation. By this method ergosterol with a vitamin D potency of some 10,000,000 rat units per gram is produced at a cost said to be very low in comparison with artificial methods of irradiation.

As a result of his discoveries in the irradiation of foods, Dr. Steenbock's process was patented and its application to commercial foods is now controlled by special license. Administration of the rights to use this process for foods and medicine is vested in the Wisconsin Alumni Research Foundation, an organization of the University of Wisconsin, to which the profits accrue. Several manufacturers, including a company which sells cereal foods, and another which produces yeast, are irradiating their products by the Steenbock process.

Early in the investigations on the irradiation of foods Steenbock and his colleagues worked out a complete irradiated diet which cured rickets in rats, and found proof that even normal babies could have their calcium retention increased by feeding them irradiated olive oil.

Dr. Amy Daniels, of the State University of Iowa, found that irradiated milk and irradiated olive oil were both more effective than cod liver oil, and Dr. Hess

demonstrated that irradiated cottonseed and linseed oils were as effective as cod liver oil in curing rickets in rats.

Out of these early experiments have come a long list of foods that can be successfully irradiated. Most animal and vegetable food materials which contain oils have present in them the solid alcohols in which vitamin D is produced upon irradiation. Among these are corn, coconut, and peanut oils, lard, oleomargarine, and butter. Mineral oil, however, cannot be activated because it contains no substances in which vitamin D can be formed by irradiation. The cereals include refined wheat flour, whole wheat flour, wheat cereals in other forms, oatmeal, corn meal, and corn starch. Meat, milk, whole or dry, various vegetables, and orange juice also can be irradiated to great advantage. The vitamin potency of egg yolk was increased from 10 to 20 times by exposing hens to ultraviolet light.

Considering the short time since its discovery, great strides have been made in the development and production of vitamin D by synthetic means. Up to this time little is yet known about how the antirachitic vitamin works in the mysterious process of bone development. No precise method for the measurement of the quantity of the vitamin is yet known. The rat unit of the laboratory worker, itself accurate only to 10 or 20%, is the accepted standard at present. This unit was arrived at as the result of experience in research with thousands of generations of the standard white rat, which lives 30 times faster than man. The rat unit is defined as that amount of vitamin D which, when uniformly distributed in the standard vitamin D deficient diet, will produce a narrow and continuous line of calcium deposits in the distal ends of the radii and ulnae (knee) bones of rachitic rats.

With the exception of milk, comparatively few experiments with irradiated foods have been carried on with children. The outstanding need at present is an accumulation of evidence on which to base sound judgment in this new field of nutrition. That evidence will have to come more from clinical than from laboratory experience, since it is doubtful that feeding experiments with animals can be carried over accurately to the human being.

Because of its universal use as a food, and as the chief source of calcium in human diet, it is quite natural that much attention is being devoted to research in the irradiation of milk, which in its natural state is low in antirachitic potency.

At the present stage of research the methods being used in attempts to increase the antirachitic potency of milk are: (1) direct radiation of lactating animals, (2) irradiation of the milk, (3) addition of substances rich in vitamin D to the diet of the animal.

Dr. Steenbock has irradiated cows to determine whether exposure to ultraviolet light has any effect in increasing lactation or developing greater antirachitic potency in the milk. With the exception of a slight increase in the vitamin D content and the quantity of milk produced, the effect on dairy cows was disappointing. The same experiments on lactating goats, however, brought striking results.

Irradiation of human mothers has produced varying results. In some instances the antirachitic potency of the milk, which naturally is low in vitamin D, was increased slightly. Other experiments were less encouraging.

Studies in the direct irradiation of milk have shown most encouraging results. Dr. Steenbock has increased the antirachitic potency of cow's milk eight, and goat's milk 20 times by irradiation under a mercury arc lamp. Dr. Hess has shown that infantile rickets can be cured by irradiated milk, and other distinguished workers have had similar encouraging results. This method at present is used most generally in Germany where various cities are already supplying irradiated milk for the treatment of rickets. In Germany no less than five methods of direct irradiation of milk have been developed, and in England much important work has been done in the prevention and treatment of rickets by this means.

The vitamin potency of yeast is greatly increased by irradiation, and the ordinary cake so processed contains a minimum of 18 rat units, which is equivalent to slightly more than one unit per gram. Striking results in the treatment of rickets in babies by adding irradiated yeast to their milk diet have been obtained by workers in the State Institute of Hygiene at Warsaw. The babies thrived on the treatment, rapid healing of rickets ensued, and the small charges became energetic and playful in contrast to their earlier listless and downcast condition.

The addition of substances rich in vitamin D to the diet of cows and poultry is being studied with the hope that this method will result in increased antirachitic activity in milk and eggs. Early investigations on cows fed with irradiated hay or cod liver oil produced unimportant results, but recent experiments in adding irradiated yeast to their diet produced a marked increase in the vitamin D content of the milk.

The full significance of irradiated foods awaits the development of more complete knowledge of their effects, as well as new standards of measurement. The process at present may be complicated by the various reactions produced in different substances by ultraviolet radiations. These effects under certain conditions cause destruction of the enzymes, the active principles of serums, bacteria, other vitamins, and may produce coagulation of proteins and bleaching of pigments. Irradiation may also make food unpalatable. Such effects, however, are usually the result of irradiation in excess of the amount necessary to produce antirachitic potency. Recent experiments have shown that irradiation of cow's milk for even eight seconds increased the vitamin D activity nine times, reduced bacteria 10%, and caused no undesirable effect upon the vitamin A content.

Granted that the vitamin D is beneficial for the adult, as well as in the treatment of disease in infants, authorities in this new science believe that adults of the Western Hemisphere, at least, probably get a sufficiency of the antirachitic vitamin in their daily foods (note illustrations and their captions). In such countries as China, where the national diet is restricted to a narrow group of basic substances, chiefly cereals, the addition of vitamin D might prove valuable.

No one will deny the far-reaching possibilities revealed by the discovery of vitamin D and methods for producing it, but the complete answer to the question of the part it will play in public health still lies in the unfathomable future. Until that answer is given in clear and unmistakable terms the public should seek the judgment of experts before using irradiated substances.

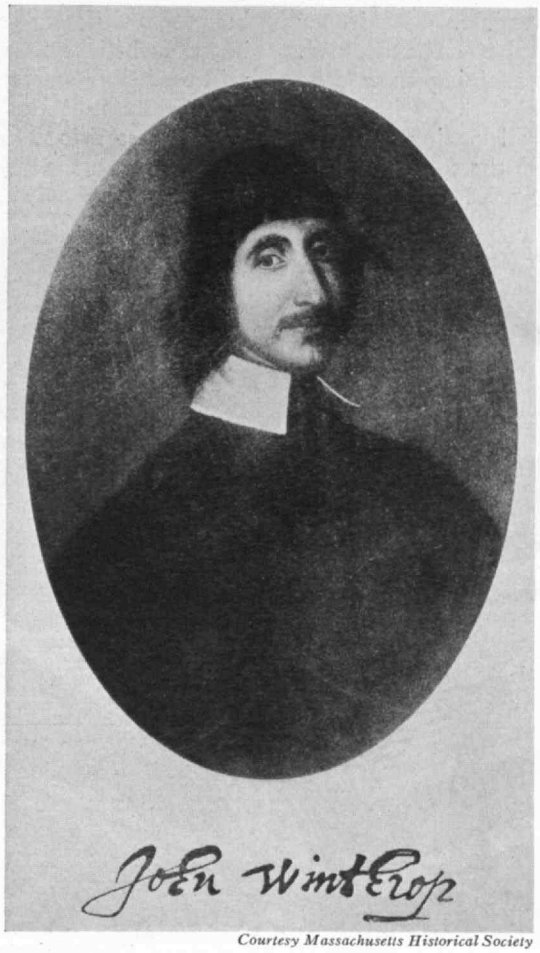
THE TREND OF AFFAIRS

Alchemy in Old New England

THREE hundred years ago this year, the John Winthrops, father and son, came to Boston. The elder John Winthrop became the second governor of the Massachusetts Bay Colony, and the younger in due course became the first governor of Connecticut. In connection with the celebration last year of the tercentenary of Boston, we have heard of their importance in the political and social life of the young colony. They also gave economic life to New England, especially the younger Winthrop who was alchemist, chemist, physician, and the first manufacturing chemist and practical technologist in the English colonies of North America.

John Winthrop, Jr., imported chemicals and laboratory apparatus from England in 1633. In 1643 he began the manufacture of iron at Lynn and at Braintree and, in 1648, he was granted a commission by the General Court of Massachusetts to manufacture salt. Two years later he planned a chemical stock company, the first in America, for the manufacture of saltpeter, and in the year afterward was granted by Connecticut the first monopoly for the working of lead, copper, tin, antimony, vitriol, alum, and other materials. He also started the manufacture of glass. In 1662, during a trip to England, he read before the Royal Society a paper on the manufacture of tar in New England, and in the following year carried out for the Royal Society experiments on the brewing of beer from maize. He was a famous practitioner of medicine, and made use of chemical remedies which he prepared himself.

He was a member of the Royal Society, and a friend and correspondent of Robert Boyle, Kenelm Digby, and other men of science in England. In his large library there were many books devoted to chemistry and medicine, and also a number of alchemical books which had formerly belonged to Dr. John Dee, the physician of Queen Elizabeth. Many of his books, manuscripts, and letters are preserved at Boston today in the library of the Massachusetts Historical Society. He died at Boston, and is buried in the same tomb with his father in the churchyard of King's Chapel.



Courtesy Massachusetts Historical Society

JOHN WINTHROP THE YOUNGER. HE BROUGHT ALCHEMY TO AMERICA

Winthrop's friend, George Stirk or Starkey, was the most famous of American alchemists. The son of a Bermuda clergyman, he came to Harvard for his education and graduated in 1646. He practiced medicine in Cambridge or Boston in 1647, and was established in Boston in 1648–1650. Later he went to England. His pills and his oil of sulphur were well-known nostrums, and his alchemical writings, issued in part under his own name and in part under the pseudonym of Eirenaeus Philalethes, were long held in high repute by the adepts. He claimed to have discovered the secret of transmutation in 1645, and actually convinced a number of reputable persons that he had done so. He died of the plague at London in 1665, according to one account while in prison for his debts, according to another because he dissected the body of a plague victim.

Interest in alchemy was prevalent in the New England colonies. In 1657 Jonathan Brewster, the son of Elder Brewster of Plymouth Colony, was carrying on the search for the Grand Arcanum in a cabin at the trading post of Manheken (Monhegan), afterwards a part of Norwich, Conn. He wrote to John Winthrop, Jr., telling of his experiments in the preparation of the red and white Elixirs and of his doubts of their successful outcome. William Avery was seeking for the alkahest at Boston in 1684 and had taught his son, Jonathan, to be "an assiduous laborer at the chemical fire," as is attested by his letters to Robert Boyle. Other later alchemists were Judge Danforth, Dr. Aeneas Munson, and President Ezra Stiles of Yale, the last-named being comtemporary with the American Revolution.

Widia, Sire of Carboloy, or Another Adventure of the Metallurgists

HEPHÆSTUS was the ancients' god of fire, one of the ten "great gods," and the finest artificer in metal among them. In latter days he went somewhat into eclipse, but now we find him again in the ascendency and we hasten to limn the achievements of his protégés, the metallurgists. One of these, Dr. Robert S. Williams, '02, of the Institute's Department of Mining Engineering and Metallurgy, has

told the story of "carboloy" and we pass along this tale of another feat accomplished by these men who work with metals.

A few years ago a small amount of a cutting material came into this country from Germany. It was known as "widia" and while it had some remarkable properties, attracted surprisingly little attention. Some three years ago the General Electric Company became interested in this new material because of troubles in their own machine shop using well-known cutting steels. The investigation and development of this material was taken over by a number of members of the Schenectady research staff under the direction of Dr. S. L. Hoyt and, as a result, a greatly improved material is now available under the name "carboloy."

This material is essentially an alloy of the very hard abrasive material, tungsten carbide, the fine particles of which are cemented together with metallic cobalt. It is not a true alloy in the sense that it is not produced as a result of melting, but it is made by sintering the carbide at high temperatures and under heavy pressures with cobalt as a binding material. Many other companies are now manufacturing a similar material although the great interest in this new cutting material has been stimulated almost wholly by the researches and publications of the General Electric Company.

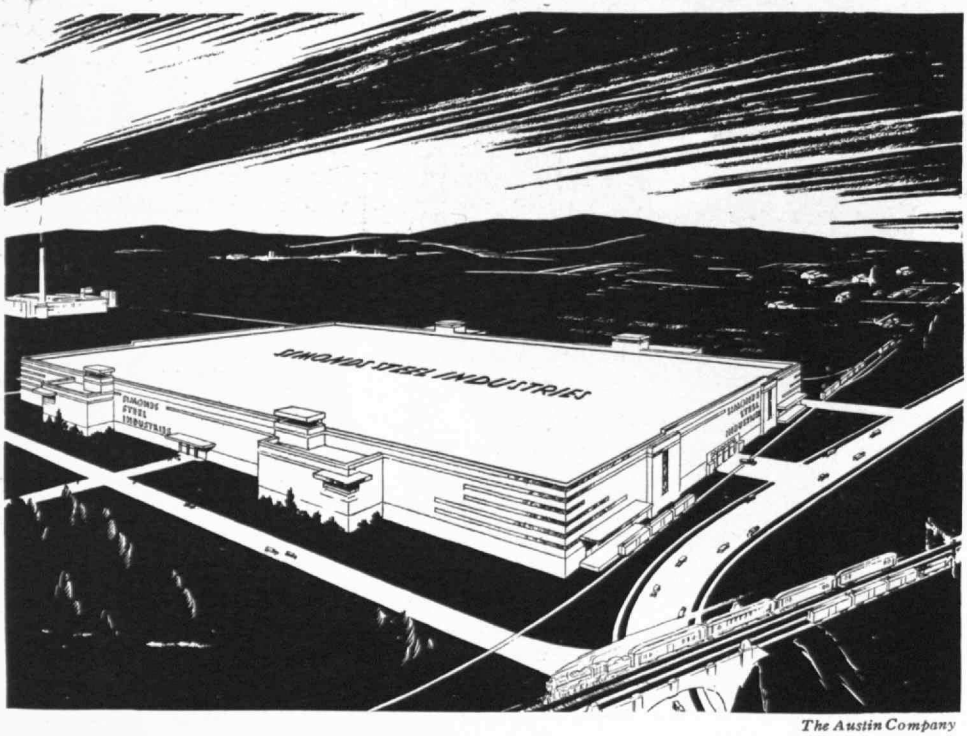
Carboloy looks like tool steel and has about half its tensile strength. It is so much harder, however, than any tool steel now known that it will do many things that were formerly believed to be impossible. With it, for example, porcelain can be cut, glass tubes can be threaded. Dr. Hoyt has even succeeded in machining threads on sapphires.

In cutting off steel with the usual cutting material, about 100 cuts could be made before the tool had to be re-sharpened. With carboloy 15,000 cuts have been made on the same material and of the same dimensions before re-grinding became necessary. With ordinary automatic cutting tools a four and a half inch hole was made in cast iron and the tool needed to be ground after about 100 holes had been made. With carboloy nearly 1,000 holes can be machined before grinding is necessary. A bronze bushing was bored with a tolerance of 5/10,000 of an inch. The old record was 150 bushings before re-grinding was necessary; with carboloy the number of bushings made has been increased to 7,000. These examples will illustrate the advantage of the use of this new alloy for special purposes.

It has, however, several disadvantages, the greatest of which is perhaps its brittleness. On account of this quality the tools are specially designed and the machines used with carboloy must be heavily constructed so that the minimum amount of vibration occurs during the machining operation. For the last few years carboloy has commanded the high figure of $450 a pound. This price, however, has been materially reduced during the last few months and it will be sold at a still lower figure in the near future.

The outstanding uses of carboloy are probably found in the field of cutting of abrasive materials, as, for examples, the insulating material used in the electrical industry, asbestos, wood, ivory, and other substances that are not necessarily extremely hard but are so abrasive that an ordinary cutting tool loses its sharp edge in a short time. The manufacturers do not feel that these tungsten carbide tools will displace the older types of cutting steels, but they believe that for certain special uses carboloy will prove an invaluable material.

Certainly it is the greatest contribution to machine tool processes since Taylor and White at the close of the last century made their great study for the Bethlehem Steel Company whereby the company's machine shop output was increased more than 500%.



The Austin Company

FACTORY WITHOUT WINDOWS, TO BE ARTIFICIALLY ILLUMINATED AND VENTILATED. THE SIMONDS SAW & STEEL COMPANY, FITCHBURG, MASS.

Claustrophobia or Utopia?*

IT IS a far cry from California to Massachusetts, and there is a notable difference between a moving picture and a saw. Yet it is because of experience gained in erecting talking picture studios in California that the Austin Company of Cleveland was selected to build the new windowless factory of the Simonds Saw and Steel Company in Fitchburg, Mass.

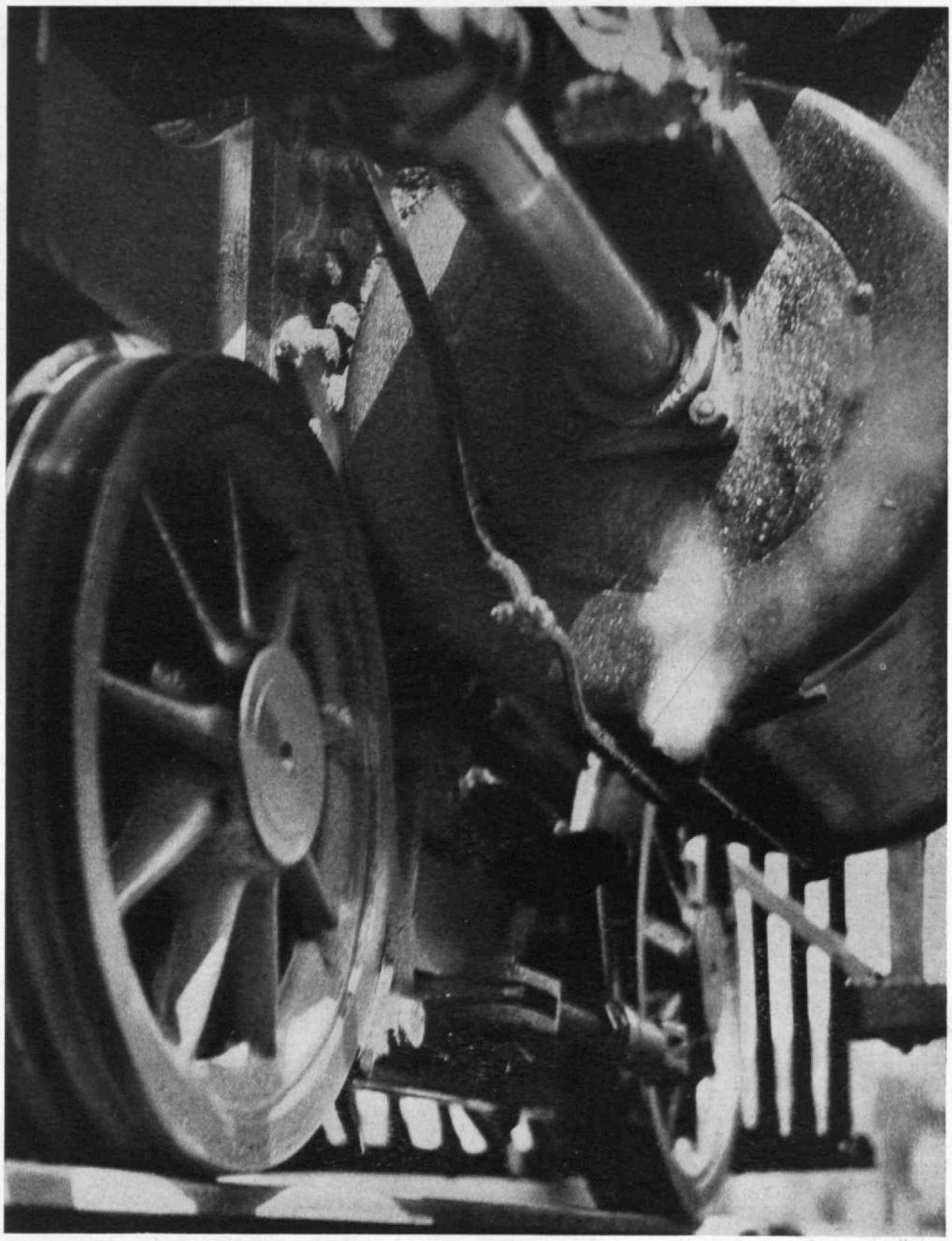
The outcome of this seminal experiment will be carefully watched. The greatest

* The dread of being in an enclosed place. Allied words are: *batophobia* — morbid dread of high objects or of being at a great height (*acrophobia*); *agoraphobia* — dread of crossing, or of being in the midst of, open spaces.

unknown factor is the psychological effect on the workmen of these unusual factory surroundings. Will they result in claustrophobia? The American workman is conservative in many ways, and may dislike the sense of isolation from the outside world and what may become deadly monotony under even perfect working conditions. It may, however, be a great boon not to have to look out upon the unlovely purlieus of that city.

The saw company is erecting this new type of factory because it believes that by controlling the conditions under which its employees will work so that they will be uniform throughout each day and night in the year, and conducive in every way to the comfort and ease of the individual worker, the efficiency of that worker will be increased by at least 30%. Everything that will affect any of the five senses unpleasantly will, as far as possible, be eliminated.

The factory will be a silent place, or at least be as quiet as it can be made by noise-eliminating devices. The walls will be constructed to absorb, not to reflect or transmit, sound. The machines will be mounted on blocks of cork, and will be so shielded that any sound waves originating from them will be broken up. Noises from materials in process of manufacture will be reduced by causing those of similar frequency to counteract each other. It is hoped that it will be possible to carry on a conversation in an ordinary tone, even in close proximity to the moving machines.



Kitlase

STUDY IN THE ANATOMY OF A LOCOMOTIVE

In any building lighted by daylight, the intensity of the light is constantly changing, and there is a constant strain on the eye muscles and the optic nerve in the attempt to compensate for this change; this is an important cause of fatigue. Such direct sunlight as falls on windows or skylights contains, it is true, the beneficial ultraviolet rays, but these are removed by window glass.

In this windowless building, lighting will be from 1,000-watt electric lamps, placed 18 feet above the floor, and enclosed in special diffusing shades. These will furnish a density of illumination of 20 foot-candles at the working plane, which will be conducive to accurate and quick vision. A certain proportion of ultraviolet light will be introduced, but this presents a real problem because of the meagre knowledge of the necessary health rays and the limited methods for artificially producing them. Failure of the power source is provided for by a stand-by storage battery.

The air in the factory will be washed as it enters the building; it will be heated in cold weather and cooled by a spray in hot weather. The temperature will be kept constant. By a series of baffles, drafts will be eliminated.

The well-known psychological effect of color in depressing or exalting human beings is made the basis for a decorative scheme. Blue, green, and white have been chosen for the walls and ceiling. The machines will be painted a brilliant orange, thus increasing the visibility of the moving parts, to reduce accidents. The machines are arranged for straight-line production, and handling is reduced to a minimum. Everything is planned to eliminate fatigue due to unnecessary motions, and every comfort and convenience for the workers is provided. The rest rooms will have fittings similar to those in the better class of hotels.

Should this experiment prove successful, if the expected increase in efficiency is attained, and the two-shift system results in the reduction in overhead, we may see radical changes, not only in factory buildings, but in whole industrial communities. This factory is to cover the area of two ordinary city blocks and there seems to be no really important technical reason why it should not cover two square miles. It is possible that we may yet see whole industrial cities without windows, and without open streets.

Streets serve two useful purposes; they furnish openings to the sky, through which daylight may reach the windows of adjacent buildings; and they furnish space for the agencies of transportation. But they also give noise, dirt, and dust, and at times a slippery surface covered with sleet, snow, or slush.

That a street can be maintained in a clean, well-lighted, and ventilated condition if only it be covered, is evidenced by the Hudson Vehicular Tunnels. These are, after all, only underground streets. A street can just as well be within a building, if the building is windowless. It can be underneath, or on any floor. The roof, of course, would be reserved for airplanes. Railroads, moving sidewalks, and stairways, and ramps for motor vehicles could be provided for. Signaling systems would function without interference.

Of course, windowless buildings are not really new in principle. Whole floors in the Grand Central Station and the adjacent hotels are windowless. Nearly every skyscraper in New York has basement floors which are practically isolated from daylight, and there are miles of underground streets or passages. A windowless building or city is unique only because it has been planned to be that way.

Prolegomena on the Uses of Water Gas

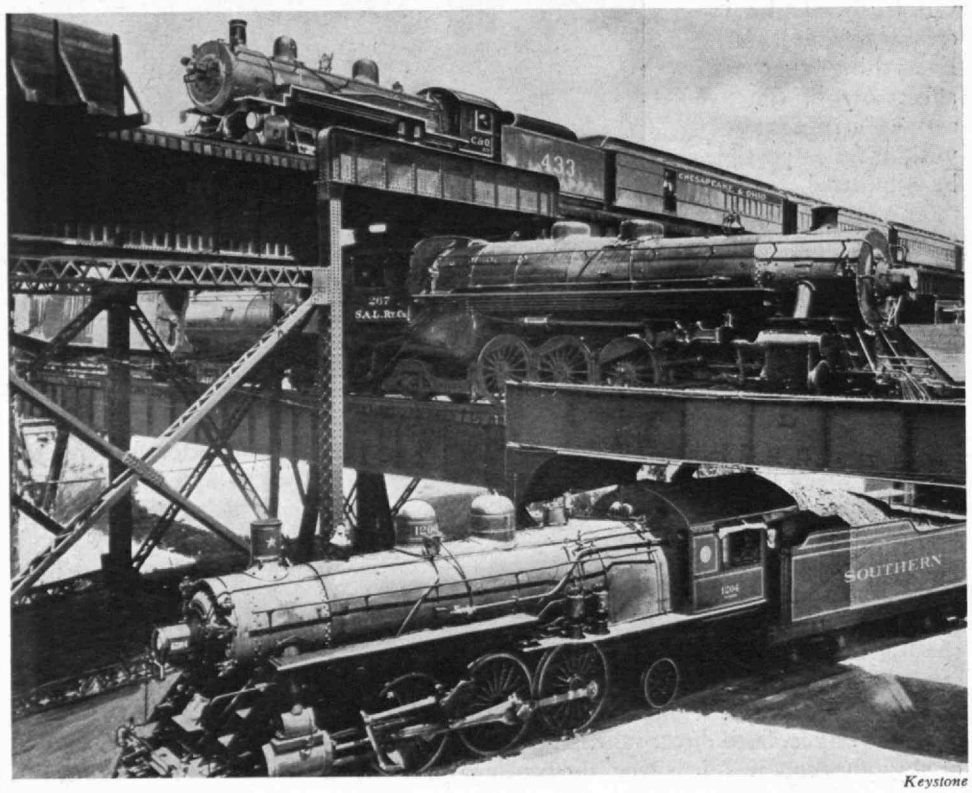
HIGH pressure *per se* may not be of great significance to the layman, but if he be an observant layman, he will soon discover that high pressure eventually will mean something to him, perhaps in terms of such mundane things as cheaper prices for staple products. Certainly the industrial chemist values it highly. By its use he has been enabled to do such things as to make a gallon of gasoline from a gallon of oil (hydrogenation), to synthesize ammonia (the Haber process), and to utilize water gas for the synthetic production of methanol. There is no chemical reason why these accomplishments may not be extended to include the synthetic manufacture of coal tar products.

The industrialist will quickly realize what high pressure means to him when it is suggested that the following products may in the future be manufactured by adding hydrogen to water gas under high pressure:

1. dye-stuffs
2. synthetic silk, more like genuine silk than rayon
3. synthetic fats and proteins.

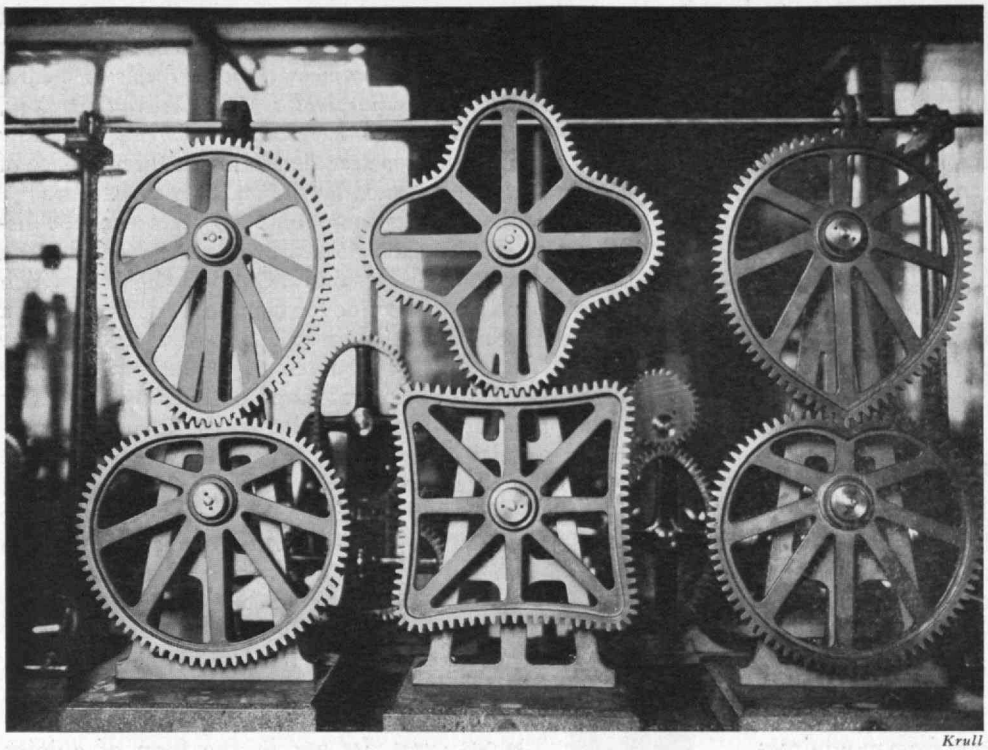
The winner of the 1930 Grasselli Medal of the Society of Chemical Industry, Dr. Per K. Frolich, '23, has recently pointed out that "in pressure the chemist has discovered a tool with which he is now rapidly opening up a new field of industrial activity. As a means of short-cutting the traditional step-by-step methods of organic chemistry pressure seems to offer remarkable opportunities. The ancient barrier between aliphatic and aromatic chemistry has been broken down by pressure. This being so, are we not justified in concluding that the chemical industry of the future will have other sources than coal tar from which to obtain its raw materials for dye-stuffs and numerous other aromatic derivatives?"

Dr. Frolich is well qualified to speak upon the prospects for the use of high pressure in synthesizing products, for it was because of his contribution to this new



Keystone

PILING PELION UPON OSSA: THREE-WAY RAILROAD CROSSING IN RICHMOND, VA.



Krull

A GEAR DESIGNER'S TOPSY TURVY LAND

chemical technique that he was awarded the Grasselli Medal. He has been extraordinarily successful in developing a procedure for testing catalysts for high pressure reactions, and it is not too much to say that today his method must form the basis for any research program on high pressure catalysis. His work was carried out in the Institute's Research Laboratory of Applied Chemistry and is but another demonstration of how research eventually makes itself felt by the man in the street.

Bargain Counter Transportation

TRAFFIC is, paradoxically, both a cause and effect of the serious attention being accorded city planning today. Its exasperations provoke public clamor for remedial measures and these, in turn, take form as bigger and better subways, bridges, widened streets, vehicle tunnels, and an enhancement of the commuting habit. The last-named weighs heavily on the railroads, particularly in the larger centers where the private automobile affords neither a comfortable nor an expeditious form of residence-office transport.

In New York the apotheosis of underground and under-river tube boring, overhead trains and highways, the Transit Commission estimates that the number of commuters entering the city each working day has risen 55% in the five years from 1925 to 1929. The figure for the latter year was 568,420 and the majority came by rail.

Seemingly, in a time when the railroads are bending every effort to woo back passenger business, a mounting army of commuters would be a welcome proposition. Not so, however, for a commuter rides on some varying form of reduced fare ticket. He pays on an average of less than a cent plus a mill per mile as compared with the average established rate of 3.6 cents per mile. So it is that, though the bulk of the commutation customers of the United States are confined to six urban areas — New York, Chicago, Philadelphia, Pittsburgh, Boston, and San Francisco — and though the records of the Interstate Commerce Commission show 57% of the 779 million passengers carried on all the country's railways in 1929 were commuters, they contributed but 8.5% of the 872 million dollars of the total passenger revenue.

The problem in New York can be appreciated by the latest twelve-month figures which show the Long Island Railroad as carrying 85 million commutation passengers, the New York Central 44.5, the Erie 31, the Lackawanna 22.6 and the New Haven 18.3. Other roads account for nearly 30 million. The New York Central's commuter business has nearly quadrupled in the last 20 years and now comprises 65% of its passenger traffic flowing through the Grand Central Terminal. This 65% yields, however, but 8% of the passenger revenue.

Both the New York Central and the Lackawanna are contending for higher fares and there is much talk of the unfairness of railroads being required to maintain private rights-of-way and pay heavy taxes thereon while public monies are being used to provide highway and vehicle tunnel facilities for competitors. Data showing that 11,912,869 vehicles (including many buses carrying commuters) passed through the Holland Tunnel during the year ending October 31, 1930, are cited as an illustration.

Commuters are not always served at a dead loss, however. The Illinois Central modernized and electrified in 1926 and, in 1929, carried 36 millions at a profit of $1,516,000 as contrasted with a loss of $645,000 on 24 millions in 1925. The Chicago and Northwestern's suburban service, which is not electrified, is said to be breaking even. It affords an idea of Chicago's North Shore commuter-load for, between 5 and 6 p.m., it operates 43 trains carrying 22,000 homeward.

One can readily deduce from the foregoing that the trunk lines have no very great interest in building up commuter traffic. It crowds terminals already bursting, complicates train despatching, fades away on Sundays and holidays and complicates the smoothness of things generally. Yet, like it or not, the railroads find it on their doorstep to stay and it is the one form of passenger traffic which is holding its own in the face of all sorts of competition.

Possibly an answer is to be found by cutting operating costs, by electrification, by providing more efficient terminal facilities, or by a combination of all three. Last autumn the Pennsylvania placed in operation in the

business center of Philadelphia adjacent to its Broad Street station, a fully electrified suburban passenger terminal which exceeds in size and scope any similar facility in the country. It is to handle 325 daily trains and its operation will be closely watched by the Pennsylvania.

Certainly, if the railroads can get the commuter problem out of the red by some means other than rate raising, they will feel relieved. To attempt rate-raising on commutation tickets, as they have learned from experience, not only means trouble with regulating bodies, but it upsets real estate values and family budgets and, thus solidifying public opinion, provokes another "of those periodical struggles which keep life in the suburbs from becoming too dull."

Set a Disease to catch a Disease

ONE of the striking paradoxes of medicine in recent years is that malaria, which has taken innumerable lives and wrecked countless others, has a therapeutic value in the treatment of certain forms of insanity. The discovery was made by W. Jauregg, a psychiatrist of Vienna, who, in 1917, observed that certain chronic mental conditions improved after attacks of malaria.

Deliberate infection with germs from mosquitoes artificially infected with blood from a malaria patient, has produced definite improvement in cases of *dementia paralytica*. Further investigations of the part that malaria may play in treatment of other forms of mental disease, including *cerebrospinal syphilis*, *dementia praecox*, *confusional insanity*, and *encephalitis lethargica*, are now being made. Time alone can determine the permanence of the cures already effected by the malarial treatment.

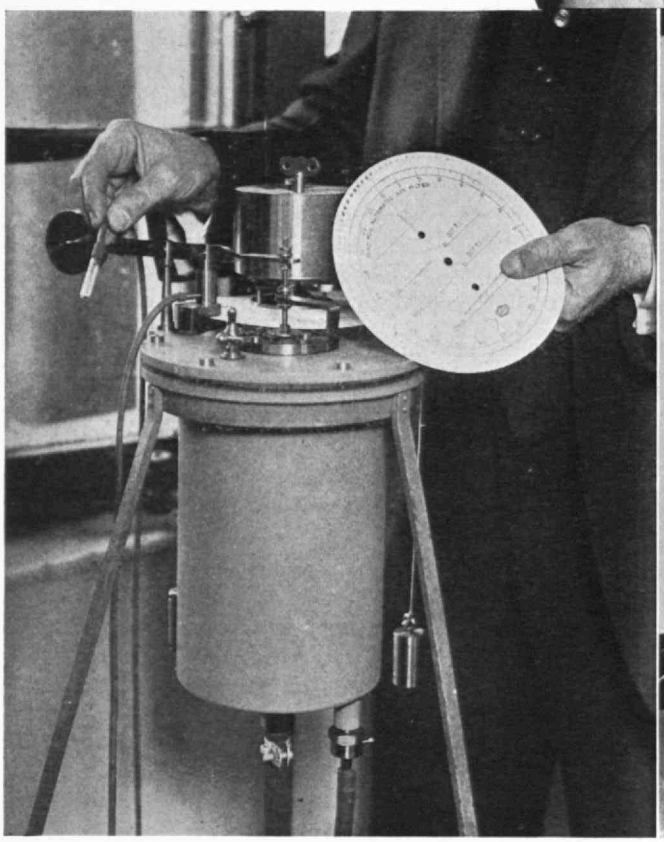
These developments come some 300 years after the discovery of quinine, and 50 years after the identification of the germ that causes malaria. Quinine, the drug which today stands as the specific for malaria, is derived from a Peruvian tree called cinchona. The name is said to have derived from that of Countess Cinchona, wife of the Viceroy of Peru, who was cured of fever by the bitter juices of its bark. Legend has it that the countess' physician, one del Vigo, was told of the curative value of the bark by Peruvian natives, who are believed to have used it for malaria long before it was known to the white man. Cinchona is credited with its appearance in Europe. It was not until 1880, however, that Alphonze Laveran discovered the malaria germ.

Long after its discovery cinchona bark was exploited by charlatans as a remedy with secret powers for miraculous cures. Its use in the form of quinine advanced steadily under scientific control, and today quinine and sanitation are the chief methods of control for malaria.



THE BATTLE AGAINST SMOKE. BELOW: APPARATUS USED BY NEW YORK METEOROLOGICAL OBSERVATORY TO OBSERVE POLLUTION IN THE AIR. LOWER RIGHT: AN ELECTRIC EYE ON THE ROOF OF A BUILDING CONNECTS WITH THIS RECORDING DEVICE TO GIVE A GRAPHIC RECORD OF THE AMOUNT OF SMOKE IN THE AIR

LEFT: UMBRASCOPE WITH ITS SERIES OF LENSES USED TO GAUGE THE DENSITY OF SMOKE POLLUTION. THE COST OF SMOKE POLLUTION IN NEW YORK IS ESTIMATED TO BE $16.00 PER CAPITA





Gallaway

Pharology

IN the world of the mariner the Nantucket lightship holds a high place as one of the most important beacons in the seaways of the globe. Riding 41 miles off the New England coast and farther from shore than any other lightship, it warns transatlantic traffic of the dangerous Great South Shoals and it serves as a reference point by which navigators plot their courses. Such an important navigation aid requires the best possible equipment and the Department of Commerce, by ordering the construction of a new lightship carrying a crew of 16 and every modern signaling device, has recognized the need.

This latest refinement of lightship design calls attention to the story of man's long efforts to make the sea safer for sailors. Pharology, the science of lighthouse construction probably originated in Egypt, for the earliest beacons were built by the Libyans and Cushites in lower Egypt where priests maintained great fires to aid navigators. Lesches, the Greek poet, mentioned a lighthouse as early as 660 B.C. at Sigeum, now Cape Incihisari, in the Troad. Perhaps the most famous of the earlier lighthouses and the one which supplied the name for the science of lighthouse building was the great Pharos of Alexandria, built by Sostratus of Cnidus in the reign of Ptolemy II. Legend has it that this great tower lifted its spire to the height of 600 feet, but historians have found little evidence of such a height.

The next great lighthouse builders were the Romans. Examples of their art include the famous tower at Ostra, built by the Emperor Claudius about 50 A.D., and the lighthouses at Ravenna, Pozzusli, and Messina. The earliest lighthouses in western Europe were built by the Romans at Dover and Boulogne. The light of Cordouan, perched on a rock in the sea at the mouth of the Gironde River, is the first example extant of a wave-swept tower. Two earlier towers are said to have stood on the site now occupied by the present one, started in 1584 during the reign of Henry II of France, and completed in 1611. The upper section of this splendid Renaissance tower was removed near the end of the Eighteenth Century to be replaced by a loftier structure at a height of 207 feet. Until then the light in this beacon was a fire of oak logs. Later coal was burned.

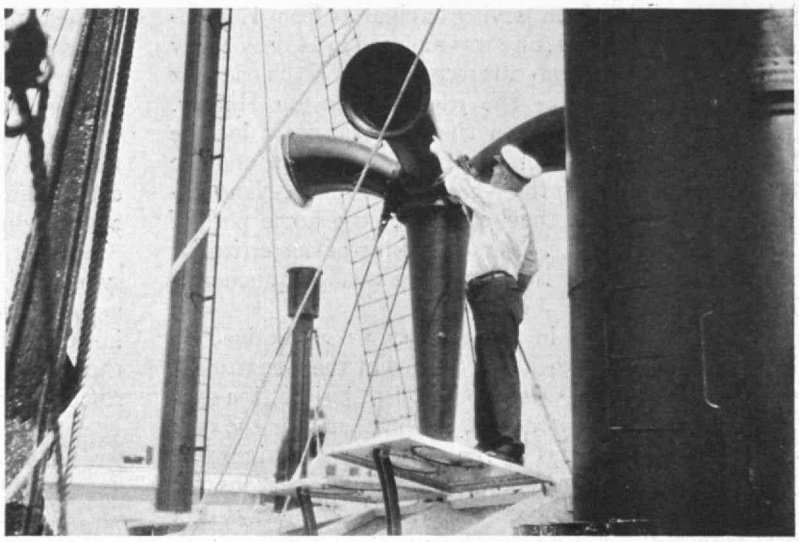
Up to the end of the century the lighthouses of Great Britain and the United States were of inferior construction to those of other countries having important coastwise shipping. Many of the earlier lights on the coast of England and Scotland were privately owned towers, in the summits of which wood or coal was burned in huge grates or chauffers. Coal lights were in use on the Scottish coast as late as 1816, in England until 1822, and in the Baltic until 1846. The use of oil then came into favor marking the era of light without smoke, for in those earlier lights billowing smoke often entirely obscured the light of the fires.

The father of Robert Louis Stevenson, Thomas Stevenson, a distinguished civil engineer of his day and an authority on lighthouse construction and equipment, made important improvements in the lens systems of the lights in use about 1870. His volume on "Lighthouse Illumination," published in 1871, was considered a distinguished contribution to the engineering literature of the day. Scotch engineers, and particularly the Stevenson clan, seem to have had great influence in lighthouse engineering, for the records make full acknowledgment to the genius of Alan, Robert, Charles, and D. Stevenson, as well as Thomas.

Robert Louis Stevenson planned to follow in the profession of his father and began his engineering education in 1868. Later he was awarded the Silver Medal of the Edinburgh Society of Arts for a notable paper on lighthouse apparatus. As his delicate health could not stand the rigors of an engineer's life, he retired to study law.

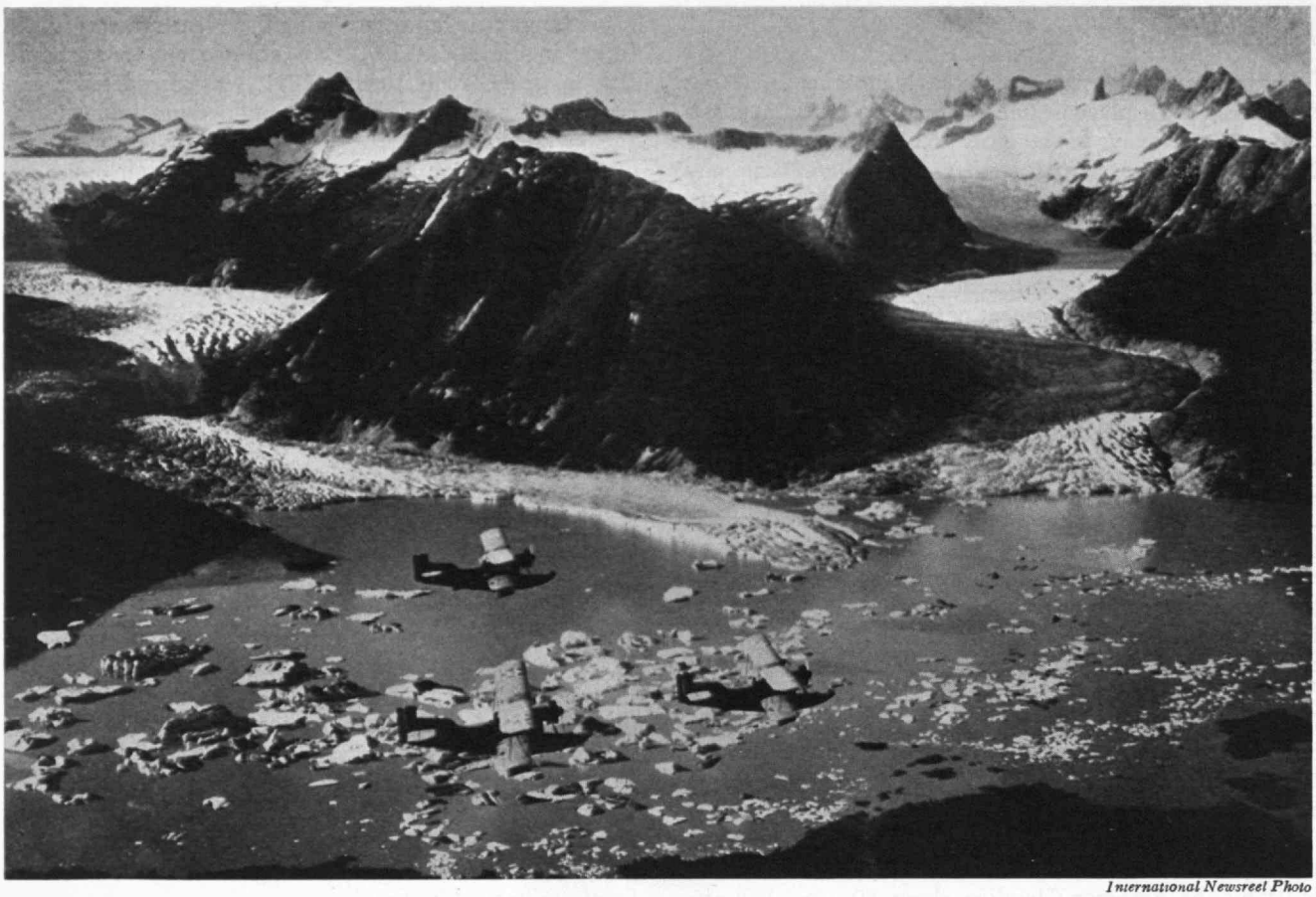
In the world of lighthouses, Eddystone Light is probably most famous. Due to the hazards of its location near the entrance to the English Channel on the sinister Eddystone Rocks in Plymouth Sound, it had to be rebuilt four times. The first tower was built in 1698 by Henry Winstanley, who was given to grotesque architectural decorations with no bearing on lighthouse construction. Utterly confident of his design, he later saw his handiwork crash into the sea during a heavy storm. The second tower, strange as it may seem, was built by a London silk merchant named John Rudyerd. He attempted to build a wooden tower, circular in form, whereas the first tower had been an irregular polygon. This tower withstood the great storms of the English Channel for 46 years and was finally destroyed by fire.

The most famous of the Eddystone Lighthouses and the one which preceded the present structure, was built by John Smeaton, instrument maker of London (see page 201). After a severe storm, he went into the forest and studied the trunk of a sturdy oak that had survived the gale while all the other trees had fallen. From this observation he came to the conclusion that there must be great weight in a small mass and that the tower must be fireproof. Accordingly, he designed his famous tower to be constructed in stone, each piece dovetailed into the



Courtesy Boston Evening Transcript

FOG SIGNAL USED ON NEW DIESEL ELECTRIC LIGHTSHIPS FOR U. S. COASTS. THE SOUNDING MECHANISM IS OPERATED BY COMPRESSED AIR



International Newsreel Photo

PLANES OF THE NAVY'S ALASKAN AERIAL SURVEY OVER TWIN GLACIER LAKES

other in a most involved pattern. The light shone from the completed structure for the first time on the night of October 16, 1759. The present tower replaced Smeaton's well known work in 1882.

The first act of Congress providing for lighthouses was passed in 1789 and the original Boston light on Little Brewster Island at the entrance to Boston Harbor is reputed to have been the first lighthouse built in America. Constructed long before Congress officially recognized lighthouses, it has been serving navigators from 1716 until today. The first structure was replaced in 1859 by a new tower and the light from this second tower is the one that now guides ships into the roads of Boston Harbor. Other early lighthouses on the Atlantic coast include Beaver Tail at the entrance to Newport Harbor and the Brant Light for which the whaling captains of Nantucket's famous fleet laid their course for the home port of that salty little island. The first lightship of the territorial waters of this country is said to have swung at anchor in Chesapeake Bay.

Aids to navigation in this country are maintained by the United States Lighthouse Service of the Department of Commerce. Until 1926 this bureau had jurisdiction over all beacons on the waterways, and in that year the task of marking the airways of the country was assigned to the lighthouse service. Since then, 1,275 beacons for aerial navigators have been established on airways of a total length of 5,877 miles. These will be added to constantly as the need arises until all important celestial courses are marked. The standard airway beacon shows a revolving beam of light of 2,000,000 candlepower, and there are various auxiliary lights and course markers to aid aviators in charting their courses from city to city from the Atlantic to the Pacific, as well as north to Canada and south to the Rio Grande.

The lens equipment of lighthouses and land beacons has been improved constantly and the apparatus now in use represents the most advanced knowledge of optics. The great lighthouses of the world are still maintained by men who are isolated for months at a time. At one time lighthouse facilities were cold and barren. Now most of them offer the average comforts of life. It is probable that the lighthouses of the future will send their beams to the watchful navigator without the aid of a human attendant, for the photo-electric cell may be adapted to extinguish the light at dawn and to set it revolving again at twilight.

Be that as it may, lighthouses will always remain a symbol of man's courageous struggle to conquer the elements. Sir Walter Scott when visiting the Bell Rock light in Scotland sat down and wrote in the visitor's book there a stanza (*Pharos Loquitur*) which captures the romance of the Pharos:

"Far in the bosom of the deep,
O'er these wild shelves my watch I keep,
A ruddy gem of changeful light,
Bound on the dusky brow of night,
The seaman bids my lustre hail,
And scorns to strike his timorous sail."

BOOKS

Scientific Book Club Selections

BY special arrangement with the Scientific Book Club, Inc., the Review is to present each month the books selected by that body as meriting the careful attention of all who desire to keep abreast of scientific thought. The selections are made by an editorial committee consisting of Arthur H. Compton, Edwin G. Conklin, Kirtley F. Mather, Harlan T. Stetson, and Edward L. Thorndike.

For December the principal selection was:

FLIGHTS FROM CHAOS, by Harlow Shapley. $2.50. 170 pages. Illustrated. New York: *The Scientific Book Club, Inc.*

" . . . a survey of material systems from atoms to galaxies. Orientation in the physical world is its guiding ambition — orientation and stimulus. 'The survey has been developed in order to show to what extent a unified classification of all known material systems can be devised; to provide practical subdivisions for several classes; to find the relation of our galactic system to external galaxies; to emphasize the importance of the substratum of particles, gas, and radiation that constitute the Cosmoplasma; to sort out into appropriate categories such undifferentiated objects as gaseous nebulae; and to mark the place of organisms in the cosmic scheme.'"

Other highly recommended books obtainable from the S.B.C. are:

DEMONS OF THE DUST, by William Morton Wheeler. $5.00. 362 pages. Illustrated.

THE PROMISE OF YOUTH, by Barbara Burks, Dortha W. Jensen, Lewis M. Terman and others. $6.00. 508 pages.

LIVING AFRICA — WANDERINGS OF A GEOLOGIST, by Bailey Willis. $4.00. 313 pages. Illustrated.

LITTLE AMERICA, by Richard E. Byrd. $5.00. 412 pages. Illustrated.

THIS THING CALLED BROADCASTING, by Alfred Goldsmith and Austin Lescarboura. $3.50. 362 pages. Illustrated.

MAN AND THE STARS, by Harlan T. Stetson. $2.50. 221 pages. Illustrated.

The Philosophy of Modern Science

THE MYSTERIOUS UNIVERSE, by Sir James Jeans. $2.25. ix+163 pages. New York: *The Macmillan Company.*

IN the first of his books for the layman, "The Universe Around Us," Dr. Jeans gave an accurate but simple non-mathematical account of the results of modern astronomical and physical research. Although his present book, "The Mysterious Universe," may be regarded as a sequel to this, it is quite complete in itself. In it he attempts to show in what way these results may influence modern philosophical thought. In the first four chapters there is a discussion of those scientific questions which influence our outlook and ideas of the universe as a whole and our relation to it.

Beginning with an exposition of the vastness of space and the extremes of temperature ordinarily encountered, the almost inconceivable rarity in this universe of organic life as we know it is emphasized. We find that the universe, far from seeming to be designed to support life, is either indifferent or actually hostile towards life. In fact the probability is so very large that at the present time it is only in our solar system that highly organized organic life exists. There is a great deal of evidence that even now our earth is being driven outside of that zone in which the delicate heat balance necessary to life exists and our race "is probably destined to die of cold, while the greater part of the substance of the universe still remains too hot for life to obtain a footing." It is, therefore, natural to ask if all that life amounts to is "clinging on to a fragment of a grain of sand until we are frozen off, to strut our tiny hour on our tiny stage with the knowledge that our aspirations are all doomed to final frustration, and that our achievements must perish with our race, leaving the universe as though we had never been?" While astronomy may have suggested this question, to answer it, or even to see in which direction the answer lies, we must delve deep into the fundamental nature of things and this will carry us right into the middle of modern physics.

In the Nineteenth Century the aim of all natural science was to find a mechanical model which would represent the phenomena studied. Mechanics is only one of the many manifestations of nature, but it was not realized until the Twentieth Century that any attempt to represent the whole by arrangements of a few of its parts is almost certainly doomed to failure. If the universe cannot be treated as a huge machine, to what then does it correspond? Before answering this question Jeans discusses briefly but vividly the more important theories, or rather principles upon which modern physics depends. Upon analysing them it is found that they reduce to a group of mathematical formulations for which in most cases there is no adequate mechanical model.

Even in such cases as that of wave-mechanics, where we seem to have a more or less definite physical picture of affairs, we find that either the system of Heisenberg or that of Dirac, which offers no such physical picture, leads us to much the same conclusions. In any event we find "that *all* the pictures which science now draws of nature, and which alone seem capable of according with observational fact, are *mathematical* pictures." The materials used are not the ordinary mathematical ideas which experience with the external world forces upon us but consist of some of the most abstract creations of pure thought. In fact "the universe begins to look more like a great thought than like a great machine." Jeans furthermore states that "a scientific study of the action of the universe has suggested a conclusion which may be summed up, though very crudely and quite inadequately, because we have no language at our command except that derived from our terrestrial concepts and experiences, in the statement that the universe (*Concluded on page 214*)

Advance on Annual Dinner

FROM President Thomas C. Desmond, '09, and the Committee on Assemblies comes information about the plans for the Dinner of the Alumni Association annually held in Boston. This year, the date for the occasion has been set as the last day in February and the place, the Hotel Statler, as it was two years ago. An innovation instituted this year by President Desmond is the invitation that will be extended to the wives and women friends of all Alumni. Alumnae, of course, have always been welcome at these dinners, and now for the first time attending Alumni are permitted, in fact requested, to bring friends with them.

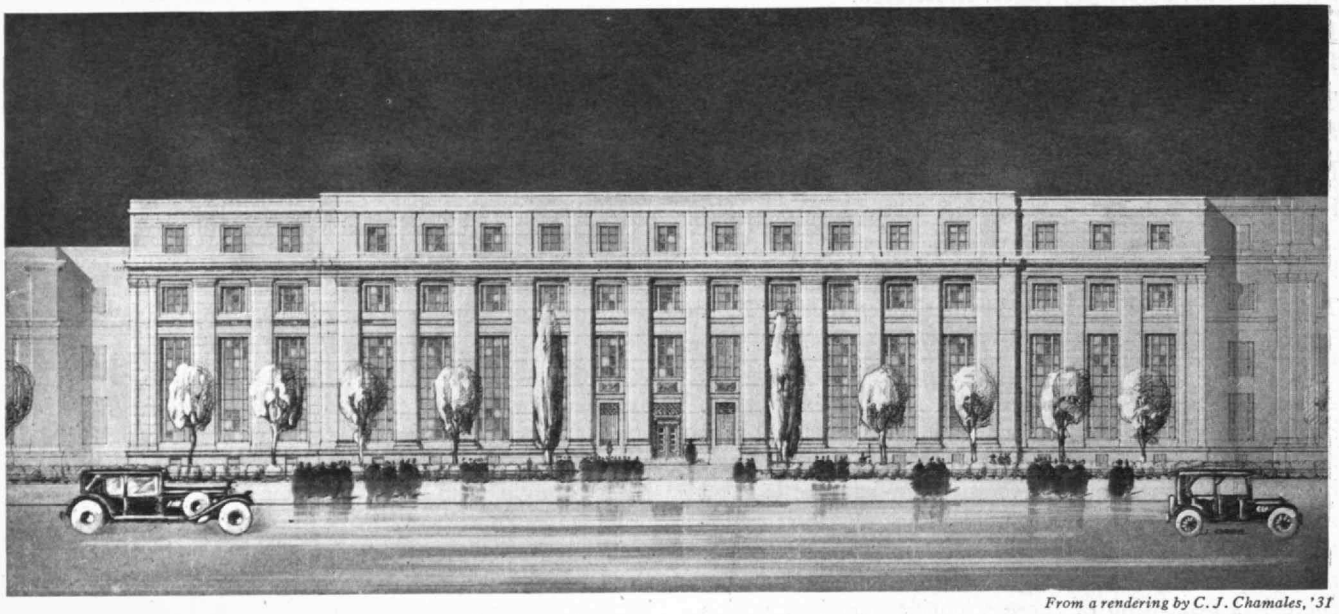
Other departures from previous procedure are promised by President Desmond and the Committee. For those who wish, facilities for dancing will be provided after the dinner, and a reception will take place before the dinner, enabling the guests to meet Dr. and Mrs. Compton, Dr. Stratton, and the heads of the various departments. There will also be an Institute exhibit presented under the care of Bursar Ford. There will be a minimum amount of speaking, and the annual report on the state of the Institute will be presented at this dinner in written form, a pamphlet including it being placed at the plate of each guest.

New York Dinner

THE REVIEW hastens to commend the Technology Club of New York for its delightful dinner to President Compton on December 8. It was an event well planned and managed, one that captured that evanescent quality that raises an over-worked routine to an occasion of spontaneous enjoyment. The Technology Club of New York may well be proud of the enthusiastic welcome accorded Dr. Stratton and Dr. Compton, Technology's administrative leaders. Preceding the dinner, a reception afforded all an opportunity to meet Dr. and Mrs. Compton, Dr. Stratton, and other representatives of the Institute and its Alumni body.

Gerard Swope, '95, introduced the guest of honor, Dr. Compton, who was the principal speaker of the evening. Dr. Compton delighted all with his recitation of plans for future developments of Technology. High lights of his remarks were: the announcement of the construction of a new physics and chemistry building which will close the court facing Walker Memorial (see below), between buildings two and eight; a spectroscopic and cryogenic laboratory to be constructed soon; laudation of the existing coöperative spirit on the part of the entire Instructing Staff and Alumni to make Technology a greater center for scientific research and learning. Dr. Compton spoke highly of the joint Student-Faculty Committee formed to study necessary curriculum changes and ways and means to increase the effectiveness of instruction.

Dr. Samuel W. Stratton, Chairman of the Board, preceded Dr. Compton, and expressed to the assembled group the best wishes of the Corporation. He remarked about the unfortunate death of three life-long friends of Technology: Frederick P. Fish, George Wigglesworth, and T. Coleman duPont, '84. Dr. Stratton also told of the recent unveiling of a tablet at the University of Virginia in honor of William Barton Rogers, Technology's founder and first President.



From a rendering by C. J. Chamales, '31

THE NEW PHYSICS AND CHEMISTRY BUILDING FOR WHICH CONTRACTS HAVE RECENTLY BEEN LET. HARRY J. CARLSON, '92, IS THE ARCHITECT AND THE SPECTROSCOPIC LABORATORY, WHICH IS TO BE AT THE REAR OF THE BUILDING SHOWN ABOVE, WAS DESIGNED BY CHARLES T. MAIN (CHARLES T. MAIN, '76, CHARLES R. MAIN, '09), INC.

As toastmaster of the evening, Richard H. Ranger, '11, President of the Technology Club of New York, set a high standard. His introductions were short, terse, and yet interwoven with effective wit and accompanied by a contagious smile. In speaking of future plans for the club, Mr. Ranger remarked that a benefit performance would be held at some New York theatre during the present winter, the proceeds from which would be used to assist in defraying the expenses of entering the Technology Crew in the Poughkeepsie regatta for 1931.

"Beginning in January," he stated, "monthly seminars will be held at the club which will afford all Alumni the opportunity of keeping in closer touch with the latest developments at the Institute and their respective fields."

One of the outstanding features of this dinner was an exhibit of motion pictures showing Dr. Compton's inaugural ceremony and the 1930 All-Technology Reunion held in June. Bursar Ford and Professor R. H. Smith were responsible for an exhibition in picture form depicting student activities, and the various courses of instruction offered at the Institute. Last (and this is mentioned with appropriate blushing) was an exhibition of The Technology Review covers for the last four years.

To stimulate and to control vocal eruptions, there was present Orville B. Denison, '11, Technology's ubiquitous cheer leader. Harold Patrick rendered a vocal selection, and with Denny led the audience in singing "Take Me Back to Tech." To terminate the very excellent program, Stephen Townsend inspired and led the singing of the "Stein Song" in a manner which would have made the beer age envious.

Progress in Civil Engineering

JOHN SMEATON (1724–1792), author of "An Experimental Inquiry Concerning the Native Powers of Water and Wind to turn Mills and other Machines depending on a Circular Motion," is credited with coining the appellation "Civil Engineer." Until the Eighteenth Century most of the mechanical and constructional arts were the vocation of the military engineer, but during that hundred-year period the development of steam motive power brought many brilliant civilians such as Brindley, Watt, and Smeaton into the field, and the last named seeing the inappropriateness of assuming a title hitherto belonging to the military, adopted the title "Civil Engineer."

With this conception of the profession the Institution of Civil Engineers was founded in England and this body defined their profession as "the art of directing the great sources of power in Nature for the use and convenience of man."

That civil engineers still adhere to this broad definition is evinced by the new fields the Institute's Department of Civil and Sanitary Engineering has entered. Two new subjects, one in geodesy and seismology and the other in aerial transportation, have been added to its curriculum. That in geodesy and seismology is considered most important because it will provide for training in seismology based upon fundamental physics and engineering subjects. Since civil engineering is responsible for the design of such structures as dams, bridges, and the modern high buildings, it is fitting that the forces applied to structures by earthquakes should be studied and taken into account in the design of these structures. Research and advanced instruction in soil mechanics and foundation engineering have been in progress for some years and among the present projects is one in which the United States Bureau of Public Roads is coöperating with the Institute.

The course in geodesy provides for further extension of the work already undertaken, and a seismograph of advanced design is under construction for installation at the summer civil engineering camp of the Department at East Machias, Maine, where the seismological observatory has already been built and is ready for the instruments. In this work the Institute will coöperate with the United States Coast and Geodetic Survey. The program of geodetic work already includes precise studies in the subject of land movements and changes in elevation, and important surveys in this connection have been made at the camp.

A new group of studies dealing with air transportation has been added to the elective work offered in the fourth year to students taking the transportation option. Students electing this option will be required to take certain subjects offered by the Department of Aeronautical Engineering in order to give them the necessary aeronautical background, and the regular course in structural design offered to all civil engineering students will be modified to include problems in the analysis of airplane stresses.

Other subjects required of all students in the transportation option deal with the fundamental problems occurring in the design and construction of airports, hangars, mooring masts, and the like. In the last ten years a number of graduates of the Course in Civil Engineering have been engaged in aeronautical engineering, particularly in the structural design of airplanes, for which their training in the theory of structures has well fitted them. Several of these graduates are now among the leaders in this special branch of the aeronautical field.

Ciencia y Conciencia

FEW subjects exert a greater appeal to the public than science. Few subjects are so misunderstood. It is with good reason, therefore, that the Institute seeks by lecture and experiment to disseminate accurate information about "the greatest edifice built by modern thought." Each year it offers to the youth and public of Boston a series of lectures with experiments known as the Popular Science Lectures of the Society of Arts. Each year the combined audiences of the series (each lecture is given thrice) exceed 6,000. The lectures are given in Room 10-250 of the main educational group.

The 1930–31 series opened on December 12 with "Grand Adventure with the Mining Engineer" given by Professor W. Spencer Hutchinson, '92. Three others yet remain. They are:

RECENT DEVELOPMENTS IN COMMUNICATION BY RADIO, by Professor Edward L. Bowles, '22. January 16, 17, 18.

SOME CONTRIBUTIONS OF ORGANIC CHEMISTRY TO DAILY LIFE, by Professor Ernest H. Huntress, '20. February 13, 14, 15.

X-RAYS AND THE STRUCTURE OF CYRSTALS, by Professor Bertram E. Warren, '24. March 13, 14, 15.

The 148th Alumni Council Meeting

THE 77 who were present at the meeting of the Alumni Council on November 24 and heard Frederick A. Hannah, '95, give his revelatory description of conditions in Russia will be shocked to learn that he died suddenly on December 6. After Mr. Hannah's trip to Boston to speak to the Council, it transpired that he was not in the best of health, although there was no indication that his trouble was serious. In behalf of the Council and Institute Alumni, this opportunity is taken to express the sorrow of all in Mr. Hannah's sudden demise.

During the past year, the Council has lost many members by death, and at its last meeting it was its duty to memorialize one of its former Presidents, T. Coleman duPont, '84. A committee consisting of Walter Humphreys, '97, Franklin B. Richards, '84, and Augustus H. Gill, '84, Chairman, prepared the following resolutions which were presented by Professor Gill:

"Whereas our former distinguished president, General T. Coleman duPont, has recently passed into spirit life:

"Resolved that the Alumni Council of the Massachusetts Institute of Technology recalls with much gratitude his keen interest in the Institute, particularly in the Mining and Chemical Departments.

"It remembers with especial satisfaction his outstanding success in raising, in the Alumni Endowment Fund drive, the sum necessary to supplement Mr. Eastman's generous offer. It wishes further to express its grateful appreciation of his own munificent and frequent gifts to the Institute, for its size, its buildings, and its funds: no worthy call, whether of Corporation or student, was unanswered.

"It desires to place on record its high esteem of the kindly, companionable, and public-spirited man, and its admiration for the patience, cheerfulness, and fortitude displayed in combating a fatal malady.

"We extend our heartfelt sympathy to his wife and family, and are grateful that we have been permitted to share with them in a life so magnanimous and full of achievement.

"Resolved that a copy of these resolutions be sent to his family and spread upon our records."

President Desmond presided over the Council meeting for the first time since his election to office last spring. He was given a rousing cheer in honor of his election as Senator of the State of New York on the Republican ticket. In acknowledgment, Mr. Desmond expressed his regret that his political activities prevented his attending the October meeting of the Council.

He presented several suggestions for the Annual Dinner of the Association, stating that the date had been set by the Executive Committee as February 28. He asked for discussion on the advisability of having women at this dinner and of having a dance to follow it. The Council seemed apathetic and no discussion ensued on either point, although there were a few desultory remarks on the choice of the hotel — a selection left to the Committee on Assemblies.

President Compton was present and spoke briefly following Mr. Hannah's address, recalling the experiences of some of his friends in the field of physics who are Russians. He likewise expressed his felicitations to Mr. Desmond upon his election to the New York State Senate.

The remainder of the meeting was taken up by routine reports, by the announcement and introduction (if present) of the following new members of the Council: Arthur L. Townsend, '13, representing Washington; Karl L. Wildes, '22, representing Schenectady; William M. Bassett, '02, representing Worcester; and Samuel P. Mulliken, '87, representing his Class.

It was also announced that William P. Ryan, '18, had been transferred from the Springfield Club to the Buffalo Club, and Ernest C. Crocker, '14, from the Buffalo Club to the Springfield Club, this change being made because Professor Ryan makes frequent trips to Buffalo.

Engineers in Who's Who

DONALD PRENTICE and B. W. Kunkel of Lafayette College have presented in *School and Society* a list of who's who among the colleges. This was the result of a study made of the 1928–29 edition of "Who's Who" which records some 28,805 biographies, of which 16,433 received their bachelor degrees from American institutions. In spite of the fact that institutions training engineers have a lower index than those training ministers and professors, Technology ranks 11, with 240 graduates represented, out of the 506 different colleges and universities therein mentioned. Harvard takes first place with 1,374 graduates, then Yale and Princeton with 937 and 480 graduates respectively, while the University of Pennsylvania immediately precedes the Institute with 261 graduates.

Aside from this classification by the total number of graduates, a comparison was made with the total number of living graduates of the respective institutions. The comparison is noteworthy although weakened by the fact that only 70 institutions replied to the request for information. This new ranking presents interesting variations: Technology's per cent of 2.02 puts it at number 31, Harvard drops to third place and Yale to sixth. Hampden-Sydney rises from 81 to first place and the College of Wooster, from which the President of Technology was graduated, rises from 52 to 27 in rank.

George Wigglesworth (1853–1930)

DEATH this year has brought irreparable losses to the Institute, particularly among the group of pioneers who have had so much to do with its founding and upbuilding. The latest is that of George Wigglesworth, Life Member of the Corporation since 1891, Treasurer of the Institute for 1891 to 1907, and ex-officio member of the Executive Committee during that period.

Mr. Wigglesworth died suddenly in Bermuda on November 26, 1930. One of Boston's most honored citizens, a member of one of Massachusetts' most prominent families, he gave himself without stint to many great educational and charitable enterprises. He was President of the Harvard Board of Overseers, the Harvard Alumni Association, the Massachusetts General Hospital, and one of the trustees of Wentworth Institute. His interest in Technology was unflagging, and he was a familiar figure to all Technology men by virtue of his regular attendance at all Institute functions.



heroes must not lisp!



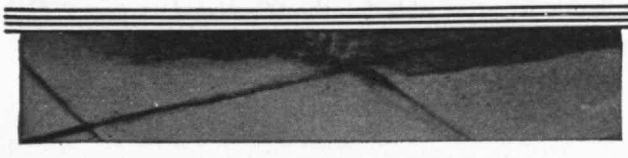
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MACHINE AGE POLITICS

(*Continued from page 182*)

In 1876 some 85% of the qualified voters cast their ballots. The figure dropped to 75% in 1904, 60% in 1912, and 50% in 1924. Despite vigorous endeavors to get all enfranchised citizens to the polls, millions refused to stir.

Then suddenly the practices and calculations of early days were brushed aside by a modern Stentor, a Stentor of metal and glass, a Stentor with electric nerves, the radio! During the presidential campaign of 1928, the first in which it was brought into general play, some two million dollars were spent by the two leading parties on broadcasting arguments and programs. At last it was possible for a prospective chief executive to reach an estimated audience of between 30 and 40 million persons in a night or two. What would the Greeks have thought of such a herald? As one newspaper said, "radio deserves credit for stirring up an interest in politics never before so strongly manifested in the history of this country. It has revealed the characteristics of personality of the outstanding candidates intimately to the calm and calculating judgment of the millions of their constiuents from coast to coast." What the printing press and the mass meeting failed to do the radio bids fair to achieve. It brings governor and governed together for personal chats in the home. The efficient State of the Greeks spreads from thousands to millions. And the percent of the eligible voters casting ballots rose from 50 in 1924 to over 60 in 1928, the first positive upward trend in half a century.

Not only did certain of the Greeks deplore the unwieldiness of giant nations, but they denounced the demagogue. Now the electrical Stentor, who has eliminated most of the political objections to large populations, has performed the added feat of casting out the devils of the soap-box orator. In the first place, radio broadcasts reach the home directly. Individual listeners, at ease in their own quarters, hear the facts presented by the distant speaker. There can be no mob psychology under these conditions. Reasoned arguments must win the voter or he will drown his disgust by turning a knob to jazz. Secondly, the radio audience is immense, and the cost of broadcasting is enormous. One cannot hire a hall housing half a continent for nothing. Consequently nationally known figures, who would not bother to stump the country and appear before many small gatherings, feel honored by the privilege of facing the microphone and take leadership in forming public opinion. Conversely, the "tin pot" politician, given to the big noise, sinks into the background, for campaign managers cannot afford to turn him loose at great expense on the radio audience. So Billy Sunday tactics, torch-light parades, monster demonstrations, and hectic tom-tom beating seemed doomed to a steady decline. The radio alone has changed the very face of democratic government.

THE technological drive in government has also broken down historical relations between political units, just as it has changed the linkage between governors and governed. To be sure, the custom of parceling off the world and each country into little areas under separate rule continues unabated. In the United States this habit is responsible for the (*Continued on page 206*)

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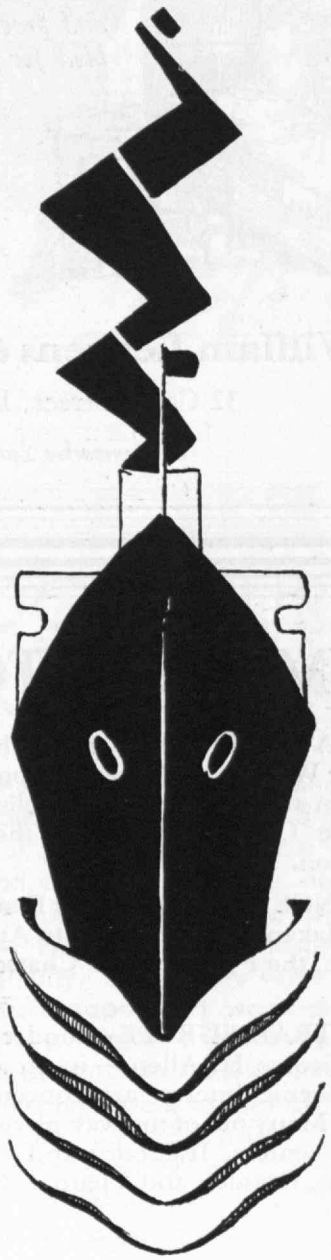
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MACHINE AGE POLITICS

(Continued from page 204)

fierce battle always raging over states' rights. In general it is responsible for the spirit of nationalism which so often sets the world aflame. But the cable, the railway, the radio, air mail, and their companions of iron and steel are steadily raising new questions respecting political boundaries.

How far is ancient sectionalism compatible with the operating requirements of modern technology? Here is a big issue for the future to face. With reference to our internal political divisions, light can be thrown upon it by an interesting judicial opinion recently rendered. In Whitehurst *v.* Grimes [21 F. (2d) 787] it was held that "radio communications are *all* interstate. This is so, though they may be *intended* only for intrastate transmission. . . . Such communications admit of and require a uniform system of regulation and control throughout the United States, and Congress has covered the field by appropriate legislation." This sweeping statement, although a shock to old-line publicists, is the only one possible in the circumstances. If a person "intends" to send a message by radio between two towns a few miles apart, in Ohio let us say, his transmission can be picked up on receivers located between those points, which may at the same time be capable of catching messages from other states. Such devices amplify all signals, regardless of their geographical origin. If the operators of these intermediate receivers hear the supposedly "intrastate" message at the same time that they are picking up Indiana stations, and interference results, the owners can bring the sender of the "local" signals before a federal court as a disturber of interstate commerce in the form of reception. And where, pray tell, can one find an inhabited part of the country in which "interstate" receivers are not in operation today or, at least, likely to be installed at any moment? Technology, supported by the law, has utterly annihilated the boundaries between the states in one branch of communication.

Nor do international boundaries fare any better. During the early part of 1930 a 100-kilowatt broadcasting plant in Moscow delivered Communist orations in the German, French, English, Swedish, Polish, and Rumanian languages. Germany protested against the programs sent out in her own tongue but was informed that they were solely for the benefit of German settlers in the Volga basin of Russia — local messages "unfortunately" heard abroad! What was to be done about this new medium, the radio, which could not be halted at the borders between nations, which could not be captured and punished? Rumania chose a drastic course. Through her Bucharest broadcast station she systematically sent out interference signals which are said to have completely blanketed the Moscow programs in Rumanian the moment they began.

(Continued on page 208)

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MACHINE AGE POLITICS

(Continued from page 206)

A cheerful thought, perhaps, but what if everyone chose to do the same thing? Little would then be heard except interference signals on the broadcast band and the radio as a medium of entertainment and education would fold up its wings and succumb to an early death. This fact Germany realized. If she sent out interference signals to garble the Moscow programs in German, she would also prevent the reading of local ship signals and tie up harbor traffic. On the other hand if she tried to retaliate by sending abroad anti-Communist speeches in Russian, Moscow might easily blot them out by interference. This little game of mutual distrust, then, would benefit nobody if carried very far. Evidently, wireless can and will ignore human frontiers and only international government, such as that represented in the periodic international radiotelegraphic conventions, can cope with the world-wide problems it has raised. Nor will the growth of traffic by airplane serve to make borders any more distinct.

We have seen how the technological drive in politics has left its mark on the internal structure and functions of the State, and on the relations of governments to their citizens as well as to one another. Evidently government is in process of change. In the upheaval which we are experiencing, our inherited ideas are doomed to be thrown in the melting pot, emerging in new molds. Fortunately, in the turmoil, the ingenuity and machinery which have carried us into the modern maze have brought with them a method helpful in finding a way out — the scientific method. This process is rarely exact, even in the industrial arts, as engineers know full well, but it is the most effective intellectual instrument which we have for ascertaining truth about difficult situations and cutting our way out of them.

AND this is not merely a dim hope. Already the scientific method is recasting the study of political institutions in our colleges and universities — slowly, very slowly, but inevitably — and it is being made manifest concretely in the phenomenal growth and activities of governmental research agencies in all parts of the country. These groups, of which the National Institute of Public Administration in New York City is typical, go out into the field, observe government at work, and gather the facts in the case — very much in the spirit of the biological expert dealing with *(Concluded on page 210)*

FACULTY MEMBER

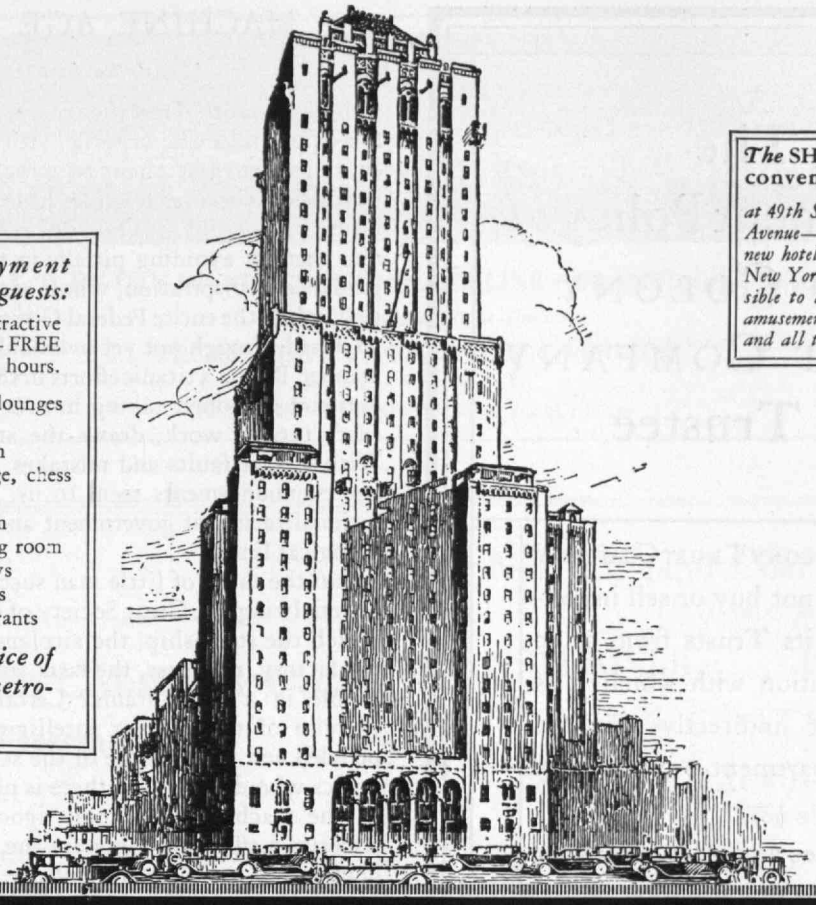
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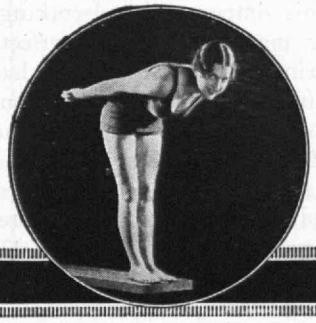
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MACHINE AGE POLITICS

(Concluded from page 208)

a phase of nature. They then review their findings, develop and apply scientific criteria with reference to desirable ends, and suggest changes, which they proceed to put into effect wherever feasible. Learning from these experiments, they build up a body of precise knowledge which aids them in avoiding pitfalls in the future. Under their guidance or inspiration, whole states have been reorganized, while the entire Federal Government has been closely analyzed, though not yet overhauled in a comprehensive manner. Russia's titanic efforts in the direction of a planned national economy, taking in every strata of society and every type of work, draws the attention of the world. With all her faults and mistakes, repugnant as many of her pronouncements seem to us, she is attempting the rationalization of government and economy along technological lines.

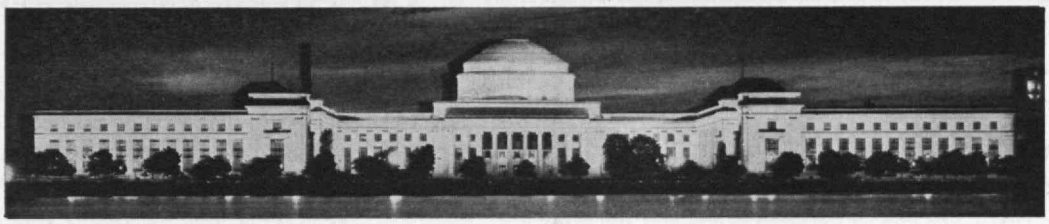
Can the mind of little man succeed in integrating and rationalizing the Great Society of our day — a Society in which the steamship, the airplane, the radio, the mine, the factory, the press, the farm, and the home each plays a rôle in a huge drama? Certainly not without the exercise of the highest intelligence that can be commanded and the best use of the scientific method. Those cynics who declare that there is no room for intelligence in the machine age simply ignore the facts. Already America's effort to eliminate the calamity of industrial depression, stabilize agriculture, and assure peace to world intercourse requires all the mental powers we possess. And the end of eternity is still a long way off.

AN AMERICAN FARADAY

(Continued from page 186)

an account of a new method of grinding and polishing glass mirrors such as are used in telescopes. At the present time he has entrusted to his inventive skill the problem of constructing the largest telescope mirror ever undertaken, the proposed 200-inch reflector for the great new astronomical observatory to be associated with the California Institute of Technology and the Mt. Wilson Observatory, near Pasadena. This telescope mirror will have four times the area of the largest mirror hitherto constructed, and in order to give it adequate strength and freedom from distortion under the influence of the heating by the sun's rays, it is planned to construct it of fused quartz. This is an optical engineering feat of such magnitude as to challenge the best scientific knowledge and inventive skill in the world, for it is a project of a different order of magnitude from any hitherto undertaken in this field.

As a background for this important undertaking, Professor Thomson has for many years been perfecting a method of manufacturing fused quartz which has proved remarkably successful in permitting the construction of quartz apparatus by machinery, in size and quality hitherto unapproached. The quartz is melted in a specially designed electric furnace, is forced under pressure into forms or moulds and, solidifying under pressure, the small air bubbles always present *(Continued on page 212)*



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AN AMERICAN FARADAY

(Continued from page 210)

in earlier quartz ware are compressed to such small dimensions as to be entirely invisible, thus a tremendous advance over the old-fashioned method of building up quartz apparatus by the individual work of a glass blower building on dab after dab of quartz under a blow pipe flame. This new type of quartz ware, besides making possible the great mirror, is also coming to be extensively used as a transmission glass for ultra-violet light in hospitals and in special lamps. It has also furnished the material making possible windows in deep sea diving bells where its ability to withstand the enormous pressures has made possible deep sea investigations of much greater depth than before.

In this great development and particularly that of the great astronomical mirror, we hope and believe that entire success will crown Professor Thomson's efforts and make possible a further investigation of the heavens at depths of space which are relatively as much greater than those now known, as are the depths of the sea now open to investigation greater than those which have hitherto been explored.

In order to give some idea of the scientific and philosophical scope of Professor Thomson's various discoveries, it would not be amiss to present here the titles of various publications in fields which are quite outside any of those already mentioned: *Change of Color Produced in Certain Chemical Compounds by Heat; Inhalation of Nitrous Oxide, Nitrogen, Hydrogen, and Other Gases and Gaseous Mixtures; On Recalescence in Steel and its Relation to Expansion, Magnetization and Hardening; Physiological Effects of Alternating Currents of High Frequency; Thoughts on Cosmical Electricity; Speculation Regarding Cause of Röntgen Rays; The Nature of the Lightning Discharge; The Nature and Origin of Volcanic Heat; The Nature of Comets and their Probable Relation to the Sun; The Light of the Firefly; A Hunt for a Great Meteor and its Lessons; Inferences Concerning Auroras; Notes on the Moon; The Heaviside Theory Valid?; Comments on the Coal Situation; The Solar Eclipse of January 24, 1925; Helium in Deep Diving; A Suggestion or Hypothesis Concerning Zodiacal Light.*

More than any man now living, or in fact, more than any man in history, Professor Thomson has combined in a most remarkable way the constructive powers of the inventor, the thoroughness and soundness of the man of science, and the kindly balance of the ideal philosopher, teacher, and friend. Because of these qualities he is held in equally high esteem by practical engineers and in the most highbrow academic circles. He has always shunned publicity and because of this his *(Concluded on page 214)*



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AN AMERICAN FARADAY

(*Concluded from page 212*)

achievements have not been highly advertised or made common objects of front page newspaper publicity, but I think all will agree from this summary of his work that a fair appraisal of its importance to the industrial and intellectual interest of the entire world, demonstrates that this man deserves in every way the tribute which was paid him by my predecessor and his friend, Dr. Richard C. Maclaurin, President of Technology from 1909–1920, who said: "In his laboratory, built right into his house and an integral part of it, he is a man from whose mind probably thoughts on scientific problems are never wholly absent, an unselfish genius, well-trained, well-rounded, well-balanced man of science," or in the words of the *Electrical World* on the occasion of the awarding to Professor Thomson of the Faraday medal of Great Britain in 1927: "And how proud the electrical industry is of her Swampscott inventor, philosopher and friend. Of all men living none except Edison has brought her so much honor and renown."

BOOKS

(*Concluded from page 199*)

appears to have been designed by a pure mathematician."

To the professional philosopher Jeans' conclusions will probably seem a confused mixture of realism and idealism, but his account of modern scientific theories, upon which these conclusions are based, is a model of clear, brilliant, and captivating exposition. No one who has any knowledge of the almost mystical mathematical operations used in modern physics will look upon Jeans' conclusion as mere sublimated anthropomorphism. Rather will he suspect with Jeans "that the universe shows evidence of a designing or controlling power that has something in common with our own individual minds — not, so far as we have discovered, emotion, morality, or æsthetic appreciation, but the tendency to think in a way which, for want of a better word, we describe as mathematical."

In any event, because of its clarity of thought and beauty of exposition, "The Mysterious Universe" will appeal equally to the layman, physicist, mathematician, and philosopher.

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THE Division maintains a list of graduates, with records of their experience and special qualifications for engineering and technical work. A list is kept of positions open.

Alumni are urged to report promptly changes of address, or changes of business connections. Officers of local Technology Clubs and Class Secretaries are urged to acquaint the Department with information which may come to their notice of Alumni interested to make new connections, or of positions open.

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DIVISION OF INDUSTRIAL COÖPERATION & RESEARCH

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ADVERSARIA

More About Technology Colors

¶ Theodore J. Lewis '76, adds still further to previous comments made on Technology's colors. "As a graduate in the Class of 1876, I have been interested in the articles in The Review for October and December relative to the selection of the colors for the Institute.

"I am sure that Mr. Fletcher is right as to the selection having been made prior to the graduation of the Class of 1876, as when I returned to Philadelphia after graduation, I brought with me, and still have, a strip of the red and gray ribbon, and Mr. Fletcher was also correct in regard to the Technology boys visiting the Centennial Exposition here in Philadelphia in that year. It was through my father that the lumber for the floors of the tents on the campus of the University of Pennsylvania (I think it was) was loaned by a local lumber dealer.

"The Class of 1878 was in error in claiming the honor of selecting and adopting the colors. Very likely that class participated in the selection, as Fletcher suggests, that the four classes, 1876, 1877, 1878, and either 1875 or 1879 appointed committees that all jointly selected the colors. I regret that I do not remember details, but I am perfectly sure that the adoption of the colors took place while I was still at the Institute."

Elected

¶ Samuel W. Stratton, Chairman of the Institute's Corporation, to the Presidency of the United States Institute for Textile Research. The Institute is designed to foster scientific research in technical problems of the textile industries.

¶ Charles H. Clark '91, to the Secretaryship of the United States Institute of Textile Research.

¶ Thomas R. Weymouth '97, to the Vice-Presidency of the American Society of Mechanical Engineers.

Honored

¶ The late Allen Hazen '88, by the City of Des Moines, Iowa. A water tower planned and erected by Mr. Hazen is to be designated "The Allen Hazen Tower" as a tribute to his accomplishments. The official minutes of the Board of Water Works Trustees read: "The approval of this proposal was supported by every member of the Board with expressions of sorrow and sincere regret over the loss sustained in the passing of Mr. Hazen, not only as an eminent engineer of international reputation, but a friend whose simplicity of manner and mode of living, whose culture and friendly spirit drew to him in close contact those with whom he had dealings."

¶ Thomas C. Desmond '09, by representing Technology at the inauguration of Rev. Aloysius J. Hogan as President of Fordham University on November 21.

Appointed

¶ John L. Mauran '89, by President Hoover to be a member of the Commission of Fine Arts. Mr. Mauran was the designer of the St. Louis Commercial Trust Company Building, the Bank of Commerce Building, the Southwestern Bell Telephone Company Building in St. Louis, the Galvez Hotel at Galveston, Texas, and the Rice Hotel at Houston, Texas. He is a member of the firm of Mauran, Russell and Crowell, architects, of St. Louis.

Written

¶ By William T. Hall '95, a "Textbook of Quantitative Analysis" which represents the actual course given students of chemistry and chemical engineers at Technology.

¶ By C. Hale Sutherland '10 and Harry L. Bowman '14, a textbook called "An Introduction to Structural Theory and Design" which has just been published.

¶ By Bancroft Hill '11, a book called "Financial Dynamite."

¶ By David F. Benbow '12, an article entitled "Your Product Overseas" which appeared in the November issue of *Factory and Industrial Management*.

¶ By William Beard '28, in collaboration with his father, Charles A. Beard, a treatise on technology in government called "The American Leviathan."

Awarded

¶ To the Massachusetts Institute of Technology, a bronze medal by the Trustees of the Massachusetts Horticultural Society in recognition of the excellent planting around the President's house. The Trustees feel that the Institute deserves credit for the maintenance of this planting, which has distinct educational value. This Society endeavors to encourage all efforts of a horticultural nature which tend to add to the beauty of a Massachusetts community.

Spoke

¶ Karl T. Compton, at the Annual Alumni Dinner of City College of New York, on November 15. Dr. Compton also spoke at the second general session of the Sixth New England Conference held under the auspices of the New England Council. At this meeting Dr. Compton emphasized the fact that scientific research is the essential modern safeguard for industrial investments.

¶ Carroll W. Doten, Professor of Economics, at Mayor James M. Curley's third conference of educators on employment conditions. The value of the five-day week advocated by the American Federation of Labor as a means of relieving unemployment was questioned by Professor Doten and other economists.

¶ Arthur D. Little '85, on "Chemistry as an Investment" over the National Broadcasting Company network on November 19. This was under the auspices of the National Research Council.

¶ Frederick H. Newell '85, on the opportunity of the engineer to help solve some of the big problems of the day, at the Annual Dinner of the Washington Society of Engineers on November 19.

Predicted

¶ By Robert F. Elder, Assistant Professor of Marketing, that major fluctuations in employment ultimately would be practically eliminated through accurate sales forecasting. Professor Elder made this prediction at a conference of research methods held by the Associated Industries of Massachusetts.

Dedicated

¶ To William Barton Rogers, a tablet given by the Virginia Alumni. This tablet is given to the University of Virginia and bears the following inscription: "William Barton Rogers, December 7, 1804–May 30, 1882, Professor of Natural Philosophy at the University of Virginia, 1835–1853, Founder 1859 and President 1865–1870, 1878–1881 of the Massachusetts Institute of Technology, in whose memory this tablet is placed by the Virginia Alumni of the Institute, December 7, 1930." Chairman Stratton was present in behalf of the Institute.

Designed

¶ By Annie G. Rockfellow '89, the new Young Women's Christian Association building in Tucson, Ariz.

Deaths

¶ Reports have come to The Review since the last issue of the decease of the following:

¶ Joseph H. Walker '82, on November 5, at his home in Hollywood, Calif. Mr. Walker was a retired nurseryman.

¶ Henry K. Babcock '99, on October 27, at Neenah, Wis.

¶ Nathan N. Prentiss '11, on August 1, near his home in Brookfield, Mass. He was killed in an airplane crash while in the performance of his duties as transport pilot.

NEWS FROM THE CLASSES AND CLUBS

1875

For seven years following graduation, the Class held no meetings. In 1882, Hammatt and Hibbard were the mediums of reviving the class association and a reorganization was perfected, styled "Class of '75, M. I. T." Thomas Hibbard was elected President; Horace E. Stowe, Vice-President; John Cabot, Secretary-Treasurer; Horace E. Stowe, Morrell A. Smith, and Leonard P. Kinnicutt, Executive Committee; Edward A. W. Hammatt, Historian. After serving two years, Cabot resigned as Secretary-Treasurer and Hammatt was elected in his place. He served the good cause admirably for 43 years, more particularly as Class Historian, as his unworthy successor is now and again reminded of his shortcomings. All these officers have died except Hibbard, the continuous praiseworthy President, now serving his forty-eighth year, and Cabot, who has failed to attend meetings in recent years.

The first class meeting and dinner was held on January 26, 1883, and thereafter it has been a customary happening. The regular forty-eighth class dinner and annual meeting will be held at the Engineers Club, Boston, on January 10, 1931. On this occasion the Class Treasury is to be the host and there will be no charge to those attending the dinner, for there is more money on hand than the Class has any need of, but not enough to build a laboratory. Incidentally, no class dues have been levied since 1927. It has been suggested that the Class present a serviceable clock, with an appropriate tablet, to the Institute, to be placed in the lounging room of the new dormitory, where the correct time will be daily appreciated. This will be acted on at the forthcoming meeting.

At a regular annual class meeting some score years ago, it was moved, seconded, voted on, and unanimously carried, that so long as two of the Class are able to answer "present" there is to be held an annual dinner. Alas! the genial good fellows foremost in urging this proclamation are no longer able to answer "present." Two of these champions were fond of prophesying that they would be the last to go and one waggishly outlined my obituary, with befitting resolves. It is recalled that Benjamin Leighton Beal was to hold class meetings and dinners all by himself in honor of '75 and the glory of Technology. We hold him in jocund memory dear.

In the Class History published in April, 1926, Hammatt tells that he had found 193 names of men who were members first and last with '75. On entering the Institute in 1871, the Class enrolled 91 regular students, and 21 specials. Of the 29 who graduated in 1875, Hibbard, Prentiss, Warren, and Webster were living on November 25, 1930, and Abbott, Atkinson, Bush, Cabot, Dorr, Eddy, Homer, Lyman, and Pierce advance the total to a baker's dozen, 13. The available records indicate that several others are or were supposed to be alive, who at one time were associated with the Class, but they are not heard from. These figures are here given by request.

In making Chevy Chase, Md., my place of residence, one of my first moves was to join the Washington Society of the M. I. T. For some years Frederick H. Newell '85, Director of the Research Service, Inc., was the dean of the society and in his welcoming me as a member, said that by my having graduated ten years before he was awarded his diploma, III S.B., I was sending him back among the youngsters. I have not seen him at a meeting of the society since. Being the oldest alumnus in Washington has advantages, which are much appreciated. More especially my thanks go to Alfred E. Hanson '14, Superintendent, Construction and Maintenance, Government Printing Office, and to Major Amasa M. Holcombe, Managing Partner, Emery, Booth, Varney and Holcombe, patent lawyers, for kindness rendered.

Much to my chagrin I was booked weeks ahead to be in New York the Saturday that President Compton paid his visit to Washington. From all accounts the reception at the University Club was a memorable event for Technology Alumni. "There were 61 present, an exceptionally large attendance. President Compton spoke for an hour and a half and none left the room. Several remarked that they would have liked to have had him continue. Much was expected of our new prexy and he topped all expectations should anyone ask, and you cannot put this too strong." This is from a letter which found me in Boston. At the Institute, a few days later, I joined Dean Lobdell on his way to the President's office and he introduced me to Dr. Compton, who has high praise for the Technology men of Washington and for the way he was entertained by them. When things are crowding and he has no wish to be disturbed, Dr. Compton possesses that rare gift of making you feel for the moment that there is nothing more to his felicity than in listening to the chatter of a bothersome old alumnus. His easy manner appeals and assures you that "this pleasure is all mine, now do not hurry away." Verily, the Institute and Alumni are to be congratulated in our President.

Two days after my return home, Mr. John M. Nagle, designing engineer of the Arlington Memorial Bridge, was the luncheon guest of the Washington Society of the M. I. T. He told the interesting story of this construction, a total cost of $14,000,000. More than half this outlay is for the sculptures and other artistic adornments, to have the ensemble in keeping with the Lincoln Memorial. On voicing our approval of the clear, concise presentation of his subject, Mr. Nagle told of his indebtedness on this score to "Foundations for Human Engineering" by Charles Rice Gow, based on lectures at Technology. He has bought six copies of this recent book and affirms that it is invaluable to technical men called on to speak of their work before an audience.

Pierce, my senior by two years, fails to agree with my getting away from the city turmoil and noise. He writes: "I lived for 20 years in the village of Mt. Carmel and have had all the country I want. My present home is on the main street, on a double track trolley which splits and leads to each side of the Yale Bowl. The cars make a racket, the baseball and football crews march by my window with their cohorts and I like it. My room is on the ground floor so as to avoid climbing stairs, for my legs have gone back on me, almost, and the more noise the better. Yes, I don't envy those who live away from city life." Should the spirit move, his address is Frank H. Pierce, 1275 Chapel Street, New Haven, Conn.

My first call in Beanland was to report to President Hibbard, who has moved from Roxbury to 18 Fairfax Road, Milton, Mass. Unlike Pierce he prefers the quiet life and the family are happy in their new home. Tom is emeritus, having resigned from the presidency of George Lawley and Son Corporation. Our talk ranged far afield and close in, to our mutual agreement, as the hours slipped by. He is in apple pie good health and cheer. I was glad to learn his pet hobby — old clocks, their possession, repairing and regulating. A second hobby is research in the early Dorchester land titles. In both pursuits he is a past master and he talks on each instructively and entertainingly.

To complete my pleasure on this visit to the old Bay State was a delightful day in Holyoke, with the Prentiss'. The hours were all too short and much I had to tell was unspoken. Will has been hard hit by a severe attack of shingles which had hung on four weeks. I little realized that this ailment could cause such painful suffering. He and dear Mrs. Prentiss said that my visit had proved the desired tonic and Will assured me that he was on the way to recovery. They are leaving for Florida soon after New Year's to remain till mid-April.

Both in going to and returning from Boston, I stopped in New York four and two days respectively and made my headquarters at the Technology Club, Madison Avenue and 38th Street. The club lends every appearance of flourishing apace. — HENRY L. J. WARREN, *Secretary*, 4700 Langdrum Lane, Chevy Chase, Md.

1883

Your Secretary has written to all Class members on record and has received a number of letters in reply. George A. Smith and George H. Bryant report a scarcity of news items. Excerpts from the letters of the other '83 men are quoted below.

Mark Lawton writes: "I have your letter of November 14, and am glad to hear from you. I haven't any news of the Class at the moment. Due to the excessive heat, over-work and indigestion I had rather a breakdown last summer. The first of July the doctor put me to bed for about a month, and then the first of September Mrs. Lawton and I sailed on the *Vulcania* for Italy.

"We had a delightful trip out on her, this being the third crossing which we have made on this ship. She touched at Boston, then the Azores, Lisbon, Gibraltar, Naples, Patras, Bari, and reached her home port of Trieste after about a 14-day trip. The service aboard these boats is delightful. The food is splendid, the cabins are very large, and everything is done for your comfort. We motored to Vienna and then came back to Trieste and to Venice, and settled down in Venice for five weeks. We came back by the *Vulcania* and I am just at the office. . . ."

Edward F. Stevens writes: "This will acknowledge yours of the 14th asking for news about the Class of '83. The only news I can think of is the passing on of our good friend Alexander S. Jenney, who died on August 16. Jenney, as you may know, was for a number of years before his sickness one of the teachers of Architecture at the M. I. T. He was, like myself, in Course IV in Architecture. Occasionally I see our member from Natick who is still working on the elimination of billboards. He thinks he is going to get a bill through to curb this pernicious habit of ruining the landscape with signs of 'Buy Pink Pills for Pale People' and such other hideous substitutes for our beautiful New England landscapes. I am still very busy trying to provide the estimated quota in hospital beds for the hospitalization of the American people, for authorities tell us we should have five beds to every thousand people and up to the last statistics we have hardly reached four, so I have a lot of work to do to try to meet that quota, and as I have just passed my 'three score and ten' I have to work mighty fast to catch up."

Dwight F. Boyden writes: "I am surprised at you, of course nothing has happened to '83. Nothing ever did happen. '83 was just like Topsy; it growed and went its way. It is little wonder that classes about our time have less class spirit than those of today; look at the way we were crowded in and split up and lived. Few of us ever really knew his classmates and Time has separated those who did. Well, such is life.

"Yours is still living in Annapolis and getting about as usual, some days less active, others more active. Old age takes its toll, but is dealing mighty generously. About all I can tell you of myself is that nobody has got that golf shaft I told you I had developed some time ago away from me, though it has been tried. It's right funny to see the predatory look that comes over a man's face in the financial districts when he sees a thing like this. Can I get control and make something out of this is written large on their faces. They would never have won at poker in the old days.

"But aside, it looks as if that shaft might turn into a winner as some of our very leading players tell me it is far better than the best hickory and makes a joke of the steel shaft. Well, that always was a joke in an iron club. I do not like to mention names but the man who has been runner-up in our national tournaments told me the other day that he did not believe there would be a leading player in tournament golf, either amateur or professional, who would not be playing the shafts inside the next year if I would only make it possible to get them by either having them made myself or otherwise.

"Enough of shafts, but a little more of golf. There are a lot of us old boys who still like a round and love company and in view of that I have asked the Annapolis Roads Golf Club to run a tournament next spring and have offered a cup. They have accepted the offer and I suppose it will be run in May or June of next year. The proposal is this: for men of 60 and over (each presenting evidence that he is at least 60) to bring his own flask, to play nine holes in the morning, have lunch and rest our dogs, and play the next nine in the afternoon. Now if Chase or any other Technology man who can qualify wants to get into it, just let me know and I'll send them a notice. I want to make it a Joy Day if I can."

Julien W. Vose writes: "In reply to yours just received: For the past few years we have been living at the Copley-Plaza for the winter months and during the summer we live in Edgartown. Twice a year for several years I have taken a trip in the early spring with my son and in the summer with my grandson, and he is a *grand son*, — he has been my chum ever since he could walk.

"Last summer we went up through the Great Lakes, Glacier Park, Canadian Rockies, Hawaiian Islands, on the fine steamer *Mallo*, then to Los Angeles, Grand Canyon, and Yellowstone Park. This summer we spent two weeks on the beautiful island of Jamaica, then to the Canal Zone and Cuba. I was surprised at the temperature; it was no warmer than at home. I have three children and five grandchildren. I have been very lucky and have had my share of happiness. My wife and I have been married 46 years and still going. What little things may influence our whole lives: While I was at Technology I met a boy who asked me to go fishing with him at Edgartown — and there I met my wife. I am very thankful that I went to Technology and met this man. I still know him and he is a director with me in the Edgartown National Bank. His name is Benjamin G. Collins, Class of '81. I have not met anyone of the Class of '83 for a long time. Can you tell me how Harvey S. Chase is doing? The last I heard he was sick down in Florida."

Boyden, I think, hits the nail on the head, in the way he describes the Class of '83 as a news producer. — Your Secretary is not saying a great deal about himself. He is what some people might call a retired chemist, but he still has his problems on hand which he hopes to work out before the grim reaper takes his scalp. — During the past year, he has been having lots of fun experimenting with the meats of the cottonseed, from which the oil has been removed by solvent extraction. This material, being rich in protein, forms an admirable meat substitute. Wesson has fed it to many of his friends, who have eaten it and are still his friends. He lives in hopes of producing vegetable hot dogs, and other delicacies of the meat-like nature, sometime in the near future. Meanwhile, he is keeping an eye on his classmates, and hopes to have more to report six months from now. — DAVID WESSON, *Secretary*, 111 South Mountain Avenue, Montclair, N. J.

1885

It seems a pity that everybody can't belong to the Class of '85. After that Forty-Fifth Reunion at Ev Morss' everyone else in the world, kings, potentates and bootleggers, had our sincere sympathy, and there kept running through our heads that touching little song we sang long ago in Sunday School about prairie children. The fact is that, although we have no overweaning modesty as to the glory, the greatness, the versatility, or the spirit of our Class, on these inspiring occasions when we all get together and see it as it really is, it seems almost uncharitable to let these poor prairie children know what they are missing. But it is not for that reason that we stay our pen; it is for the practical reason that when we grope for words of adequate description we cannot find them either in William Barton or Bobby Rogers' Mesaurus! Coleridge would be just as pen-tied as the writer and indeed, if you bar his pet ejaculation "Oh! boy," Graham McNamee would be equally up against it.

It will be ten more years before a proper estimate of President Wilson's war administration can be made, and it seems almost like desecration to take up the history of our Forty-Fifth Anniversary at this early date, for it only happened last June, the 19th, 20th, and 21st, to be exact. But it seems as though the Secretary couldn't hold in any longer, so here goes.

Somewhere along about the time when Mr. Rockefeller was making faces at Tom Edison who had invented a lamp that burned on the end of a wire, there was a lanky, sandy-haired chap puttering around the mining laboratory, who didn't eat butter. His chief distinction, and he gloried in it even then, was that he was a member of the Class of '85. He was named

1885 Continued

for some town up north of Chelsea and he was so modest that he used to practice making love on dress forms. He got by the cold faculty censors somehow, put on his overalls and got some fool ideas about insulating wire. He was so interested that we almost forgot about him. He plugged along over in Cambridge, and the more factory buildings he put up the more he got inside of them, until there came a time when the Institute he loved was just about broke and there was a suggestion that we should hook up with Harvard and end our worries. Some thought this and some thought that, and there got to be quite a ruction, almost an uncivil war. Nobody seemed to get anywhere, just argued across no man's land, sometimes almost impolite. Now everybody was pro or con except this chap, and he was both, and about the only one. He thought that the move would have great educational advantages, but didn't believe we should be forced into it because we were poor. A movement had just been started to raise a considerable fund, the first in our history, and there were those who thought that if this were so presented that it appealed to both sides, it would help to allay the acrimony of the dispute and act as a nucleus of reconstruction when the matter should be finally settled. Our friend who was consistently on both sides of the fence was precisely the man to head this thing up, and after he had washed up and considered it, he took the job.

Now you don't know what this meant. There are very few who do. It was a ticklish time. It wasn't any joke and he was no humorist. It is sufficient to say, omitting hospital records, that in the end, Moses in the wilderness had nothing on that fund. It proved to be the rallying point, and a substantial one, when the paving stones were dropped, and the net result was that a lot of money was raised, but above all we had been forced to study our Technology, and when we knew it, we stood before it in awe and admiration.

There were other things after that which interfered with the insulated wire business. A site for Technology, various and several great funds, and then again some things after that, but behind it all and inspiring it all was the fact that some time Ev Morss had determined that he would properly qualify as a member of '85. Then he went back to the factory to toil and delve, his one idea then being that he would entertain the preordained elect on the occasion of the Forty-Fifth Anniversary of '85.

Well, he did it. He had his wish. He prepared a ducal palace and set wonderful tables before us. Each man had a royal bed-chamber done in purple and fine-twined linen. He inveigled just about every old '85 reprobate who was able to crawl around and nearly cried himself sick because Tom Fry was recalcitrant. All this was but a trifle. His crowning effort was to provide some sort of a subtile, celestial atmosphere, through which wrinkles disappeared, grey hair darkened, and bowed shoulders became surprisingly erect and vigorous. How he did it we don't know, we can't even remember what he did, but if the spirit of the Reunion could have been bottled up and marketed, no one would ever after mention Falerian.

At the Class Dinner on Saturday night messages of remembrance were sent to some of those who were prevented from attending, with the signatures of all present attached. These were Dan Lufkin, Alex McKim and Charlie Brown, in Europe, Chippy Chapman in Texas, and Hugh MacRae in North Carolina. A message of affection was also sent to Mrs. Nathan Anthony, Mrs. Little's mother, who was made an honorary member of the Class when her 85th birthday coincided with an '85 dinner, and who had recently celebrated her 90th anniversary. The message was "To the bonny lassie of our adoption; only to her do we acknowledge the pledge, 'she is more than '85.'"

Those present at some time during the Reunion were: Baker, Bartlett, Choate, Cochran, Copeland, Dewson, Fiske, Frazer, A. C. Fuller Greene, Hildreth, Hunt, Kimball, Litchfield, Little, Lyman, Lyon, Means, Morss, Newell, Osgood, Parsons, R. H. Pierce, Plaisted, Pratt, Richards, Robertson, Sands, Schubmehl, Sise, Steele, Sweet, Rawson, Williams, and Worthington.

Arthur Little was so pepped up by the Reunion that he was spurred to great activity. Almost immediately he bagged the honorary degree of Doctor of Science from Tufts (to be added to the degrees of Doctor of Chemistry awarded to him by the University of Pittsburgh, 1928, and the University of Manchester, England, 1929) and in October received the Perkin Medal awarded yearly for outstanding achievement in chemistry. On November 19, Arthur made an address over the National Broadcasting Company network, on "Chemistry as an Investment," under the auspices of the National Research Council. Looks as though he might be quite a help to his folks sometime!

On November 20, a painting of Harry Talbot was shown for the first time to a group of friends and relatives at the Institute, where it will remain permanently. The portrait, a faithful likeness in oils, was painted by E. Pollak-Ottendorff of Boston. It is a gift to the Institute from a group of former students, and its title plate bears this legend: "As Alumnus, Teacher, and Administrator for forty years, he gave conscientiously and unselfishly of his brain and heart to the upbuilding of the Institute."

As the writer was on a train for Washington recently an impressive looking gentleman approached and claimed acquaintance. It was Magoun, formerly superintendent of the New York Shipbuilding Company at Camden, N. J., now retired and living at Bath, Maine. We had a pleasant half-hour before he left at Philadelphia where he was to visit his daughter. He has no active interests although he is still a director of the Hyde Windlass Company. He had just attended a meeting of the American Society of Naval Architects in New York.

A postal card from our traveling representative, Bob Richardson, is dated San José, Costa Rica, November 6. He mentioned that he expected to continue his jaunt to Colombia, Equador, Panama, and Guatemala. He is commissioned by the Class to find a suitable setting for our Fiftieth Reunion. Nothing is now left for us in America! — A letter received on November 15 from Dan Lufkin says that his stay in Germany was very beneficial and he believes that another treatment next summer will put him in as good condition as he could expect. — ISAAC W. LITCHFIELD, *Secretary*, Hotel Wadsworth, 10 Kenmore Street, Boston, Mass.

1887

President Taintor advises that he is laying aside all work for a time, and that he and Mrs. Taintor are to spend the next six months or so abroad. We sincerely hope that Giles will be back in time to preside at the Class Dinner in June, as usual, and will bring home a store of interesting experiences to relate on that occasion. — The following article concerning our classmate, William B. Blake, whose name headed the Honor Roll of the retiring employees of the Pennsylvania Railroad in the November 15 edition of the Pennsylvania *News* will be of great interest to all the members of the Class of '87, and is herewith transcribed in full: "William B. Blake, engineer of right-of-way, real estate department, was retired November 1, after a continuous connection of 43 years with the Pennsylvania Railroad system, and his name is inscribed on the Roll of Honor.

"Mr. Blake was born in Newburyport, Mass., October 2, 1865. He was graduated from the high school in his native city and from the course in civil engineering at the Massachusetts Institute of Technology in 1887. He spent the summer of 1885 as a transit man on the Boston and Maine Railroad and the summer of 1886 as an instrument man on the United States Geological Survey. During the summer of 1887 he was engaged on bridge work on the Old Colony, now a part of the New York, New Haven and Hartford Railroad.

"September 17, 1887, he entered the service of the Pennsylvania Lines west of Pittsburgh, at Louisville, Ky., and was successively assistant on the engineering corps, assistant engineer, and engineer of maintenance of way of the Louisville division and at the same time was engineer of the Louisville Bridge Company, controlled by a Pennsylvanian. He is a charter member of the Engineers' and Architects' Club of Louisville, organized in 1891, and served on its board of directors and in official positions. Effective January 1, 1901, he was appointed engineer of maintenance of way of the Western, now the Fort Wayne division, with office at Fort Wayne, Ind. He was promoted, effective January 10, 1903, to assistant real estate agent of the Southwest System, with office in the Pennsylvania Station at Pittsburgh, where he has since been located.

1887 Continued

"In 1916, he was President of the Pittsburgh Alumni Association of the Massachusetts Institute of Technology. On the termination of Federal control of railroads, March 1, 1920, when the Pennsylvania adopted the regional system, he was appointed assistant real estate agent, Central region, and effective January 1, 1924, was appointed engineer of right-of-way, from which position he was retired. Mr. Blake will continue to reside at 1002 Farragut Street, Pittsburgh, E. E., where he and Mrs. Blake have made their home for the past 16 years." — EDWARD G. THOMAS, *Secretary*, 1940 Calumet Avenue, Toledo, Ohio. NATHANIEL T. VERY, *Assistant Secretary*, 96 Bridge Street, Salem, Mass.

1889

The Tucson (Ariz.) *Daily Citizen* of October 5 carries a story about the new Young Women's Christian Association building in that city which was designed by Miss Annie G. Rockfellow, who has been in practice there for several years. Miss Rockfellow spent her vacation at Duxbury, Mass., this year visiting also other places in the East.

At the present writing Goodspeed's in Boston is conducting an exhibition of Juddy Wales' latest lithographs and water colors of sailing ships. These get better and better each year and those who fail to see them are missing a great opportunity. — WALTER H. KILHAM, *Secretary*, 9 Park Street, Boston, Mass.

1891

A recent letter from Charlie Aiken written from Sydney, N. S. W., tells of his work there and "building a building about a machine and operating before the roof is on." It takes a Yankee to show them real speed. He encloses some snapshots, one showing an apartment house where you drive onto the roof and come down (figure that out), another showing the new Harbor Bridge, 1650-foot span and 172-foot clear.

In a letter to Barney, he says, "I will take up a pleasant and inspiring subject, something that everyone here is interested in from the babe in arms to the octonegarian, and that is the subject of 'sharks.' They have two varieties of sharks here, one a large shark and the other a larger shark. They are all man eaters and they are always hungry. Each of the bathers' beaches has a shark lookout or perhaps two or more shark lookouts, each occupied by a shark watchman armed with binoculars and a 'whale of a bell.' When the shark appears the lookout rings his bell and the other bells on the other tower take up the signal and all of the bathers swarm out on the sands, where up to date this year they have been safe as so far this season the sharks have not followed the bathers out of the water, but you never can tell."

In a letter from Charlie Garrison, 157½ Bay Shore Drive, Long Beach, Calif., to Barney, he tells of a visit to Shattuck in the desert. "We left here yesterday at about eight with Bob, Catherine, and Bobbie, sped through Santa Ana, Orange, Olive — the Santa Ana Canyon to Corona and thence to Riverside — we had a fine day, no morning fog as is quite frequent these days. From Riverside on, the road was new to us through Box Spring Grade to Beaumont and Banning; then south at a junction which took us through the famous Palm Springs just preparing for its winter guests. Sixteen miles beyond we kept our eyes peeled for a home-made house and garage on the right of the road. Just as we were thinking that we had passed it, we spied such a habitation some few hundred yards from the road. There were five or six cars drawn up at the house and we thought there must be a sewing bee or other social event in progress, but it turned out to be men putting in concrete floors for garage and piazza. Someone waved to us so we plowed our way through deep sand, being careful to keep in the ruts. There was Forrest to receive us and Mrs. Shattuck just coming from the house. I had written them that I would be there at 12:00 but I must have miscalculated the 130 miles, for we arrived at 12:05. There we saw the famous well 412 feet deep, that nearly broke the bank. It was flowing its 50 miner's inches or about 8 gallons per minute, as large as life. It was nice clear soft water, about 70° temperature. Here we have soft water, the only place we have found this quality in California. In fact, Flagstaff, Ariz., is the next stop where we can count on a water that takes kindly to soap. The water here is amber colored and has an odor — not the eau de cologne.

"The Shattuck habitation is situated on rising ground with a mountain range rising at the back or south. Another range some distance to the north makes a pleasant outlook. After our cordial reception we had a nice lunch. We had brought a picnic to which they added liberally. The air was nice, though the thermometer in my car was 106°. In July 116° is not uncommon. Forrest and his son George have done a good job of carpentry as they designed and built the whole works, exclusive of the burrowing for water. I said it was the first time I had seen A. Forrest in the desert that gave practically no shade! We had to start for home at about two and Forrest took his car and showed us the date farms on the road to Indio. Here we parted and headed for home."

In a letter to the Secretary, Charlie wants to know what is the matter with Barney. He hadn't heard from him for two months. We will have to provide Barney with a typewriter (mechanical) so he can keep up with his correspondence. — Mr. and Mrs. Arthur Hatch and Mr. and Mrs. Will Fuller were rusticating at Northfield, Mass., this fall. (Taken from the Miller Falls *Gazette*) — A letter from Will Leland, tells of a five months' trip abroad with Mrs. Leland. He saw Aiken in San Francisco and Charlie gave him some news from the East. Will and Mrs. Leland were on a motor trip to Reno, Lake Tahoe, and so on, and they were planning to go up in the mountains for a three weeks' vacation.

A letter from Morris Knowles says that he is greatly improved after two months at Atlantic City, but that he is still taking things easy. — Frank Howard is President and Treasurer of the Bemis Associates, Inc., Watertown, Mass., manufacturers of Gutta Percha Products. He calls it a part time job, but it doesn't sound that way. — Jim Swan tells of seeing Henry Birks in Montreal and Henry told him that he hoped to get to the Fortieth Reunion. — Harry C. Bradley writes that he and Mrs. Bradley expected to go to Europe next summer and if so, he will miss our Reunion. — Albert Gottlieb sends in a new address, 105 West 40th Street, New York City. — George Hooper writes from Pasadena that his family have made him promise to attend the Fortieth. Hooray for the family, and we will all look forward to seeing you.

How about a Class Dinner the last of January? — HENRY A. FISKE, *Secretary*, Grinnell Company, 260 West Exchange Street, Providence, R. I.

1893

Frederic Everett Abbott, son of Mr. and Mrs. Frederick B. Abbott of Lynn, was married in New York on Wednesday, November 19, to Miss Frances Reyburn, daughter of Mr. and Mrs. Samuel W. Reyburn of 969 Park Avenue and Katonah, N. Y. — Mr. and Mrs. Henry A. Morss returned from England on November 24. They were away from Boston just five weeks, sailing on the *Laconia* and returning on the *Scythia*, of the Cunard Line. They spent the entire time ashore, eighteen days, in London; saw quite a lot of Rigby Wason and several members of his family; visited the galleries, cathedrals, shops, and other points of interest and had a very enjoyable trip.

Jim Emery has sent in the dates for Technology '93 Class Luncheons in New York, Fridays; November 28, 1930, March 27, and May 29, 1931. The time is one o'clock; and the place, the Railroad Club, 30 Church Street, 21st floor, where a room will be reserved in the name of J. A. Emery. He is very hopeful of having out-of-town men present at these luncheons. Emery says, "If out-of-town men are in New York and do not have a memorandum of the dates and place, they should call J. A. Emery of Ford, Bacon and Davis, Inc., 39 Broadway, New York, telephone Digby 3200."

In the *Literary Digest*, issue of November 22, there is an article on "Houses in Mass Production." This refers to a plan described in *The Industrial Bulletin* of Arthur D. Little, Inc., "to turn out houses by the thousand as Ford cars or as No. 8 shoes are turned out, with proportionate reduction of cost. . . . Though assembled of standard parts, these houses can be put together in so many ways that the completed houses will look no more alike than two buildings made of bricks from the same yard. . . . For the past five or ten years a graduate of the Massachusetts Institute of Technology . . . has carried on extensive research in housing structure and materials, and tried out in actual building novel structural

1893 Continued

methods. As a result, several types have been evolved, all based upon the conception of a relatively small cube as a module or unit of measure by which the proportions of other parts are regulated. . . . 'That a rich variety of effect and a wide range of architectural beauty may be attained with this modularized method and materials has been actually proved in certain houses built in the vicinity of Boston. The architect can plan freely. At the same time the householder gets the benefit in the lower cost of mass production. . . . Standardized modular design takes away nothing from what we already have, and it offers a more efficient structure from the view-points of cost, utility, and beauty.'" The graduate referred to is none other than Albert Farwell Bemis '93. He has devoted much more than ten years of effort, study, and research to the important problem of better and cheaper housing. — FREDERIC H. FAY, *Secretary*, 44 School Street, Boston, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, P. O. Box 1604, Boston, Mass.

1895

A number of the Boston contingent of the Class of '95 held a luncheon for Frederick A. Hannah '95 at the University Club, Boston, Monday noon November 24. Fred recently returned from Russia where he served the U.S.S.R. in an advisory capacity on industrial organization and management. A most interesting account of his experiences was given and enjoyed. Booth, Bourne, Chase, Eugene Clapp, Gus Clapp, Churchill, George A. Cutter, A. D. Fuller, Geiger, Jackson, W. D. Parker, Sanborn, Watkins, Winkley, Whorf, and Yoder attended.

We are very fortunate in securing some of his talk for The Review, so that all '95 men may have it. Following is a brief outline: "In January of this year I concluded a contract, through the Amtorg Trading Corporation in New York, with the Peoples Commissariat of Workers and Peasants Inspection, effective February 12, for a term of six months; renewing itself for another six months to February 12, 1931, unless either part notified the other to the contrary on or before July 12. In the contract I was designated as 'advisor on matters pertaining to industrial organization and management,' and my duties consisted of introducing American manufacturing practices into the industries of the U.S.S.R. I was told that I would be asked to take part in the allotment of capital to the industries.

"Soon after the contract was signed, I was advised by cable from Moscow to await in New York the arrival of a Russian Commission, and assist the members to become acquainted with American manufacturing practices. They arrived on February 19, and I remained in New York with them until late in April. On April 23, Mrs. Hannah and I sailed on the *George Washington* from New York. We arrived in Paris on May 2, flew to Berlin on May 7, remained four days, obtaining Russian visas and shopping, left Berlin by plane on May 11, and arrived in Moscow in the afternoon of May 12.

"And right here I want to extoll the flying service in Europe. It is reliable, comfortable, and the cost is less than first class by railway — between first and second. The flying fields in the large cities are well equipped for the comfort of passengers and spectators, having rest rooms, good restaurants, and outdoor seating accommodations for spectators or friends who are waiting for arrivals. The trip from Paris to Berlin was made in six hours including a stop at Cologne for a delicious luncheon, compared with 17 hours by train. We landed at Berlin during a thunder storm, but suffered no inconvenience. From Berlin to Moscow, the flying time was 15 hours, starting at 11 P.M. stopping at Konigsberg from 2:30 A.M. to 4 A.M., Kovno at 6 A.M. for half an hour, and Smolensk at 10 A.M. for half an hour. We were met at the flying field in Moscow by representatives of R.K.I. who took us to the Hotel Metropole where we were installed in a room which was unsatisfactory. Later we were transferred to a better room. The next day I was escorted to the offices of R.K.I. and introduced to several officials and associates.

"R.K.I. is the inspection department of the Soviet Government. Its official title is Commissariat of Workers' and Peasants' Inspection. Its duty is to maintain supervision over all the industries of the U.S.S.R. to discover mismanagement, either malicious or incompetent. It has the power to remove from office in the industries any person whom it considers is not promoting the plans of the government. If I had remained longer in the U.S.S.R. I would have made trips to other cities to inspect factories. I was requested to make one such trip, but my term of service was short, the proposed trip would have kept me out of Moscow too long, and the conditions of the trip were otherwise unsatisfactory. Therefore I did not leave Moscow.

"In order to become acquainted with conditions in U.S.S.R. I met as many people as possible of all nationalities and classes, some through my official connections and others through personal acquaintance. In all I became acquainted with about 50 persons, about evenly divided between Russians and foreigners — American, English, Germans, and others.

"The parties who visit the U.S.S.R. conducted by government officials and the tourists do not receive a true impression of the country. They are shown only what the government wishes them to see. The official guides assigned to such parties are carefully instructed where to take them, and they receive only the most favorable impressions. Living as a worker among Russians and other Americans who were there in a capacity similar to mine, and meeting many people in the daily course of life, I saw a fair cross-section of city life in the U.S.S.R.

"Immediately on my arrival and throughout my stay I was impressed by the evidences of poverty and by the strained anxious expressions on the faces of all people. I seldom saw a smile in Moscow. As I became acquainted with conditions I was not surprised, for the people were hungry and their personal lives were closely limited by government restrictions. They were living in desperate hope of better conditions soon. From people in that state I could not expect much courtesy or consideration. We did receive some of both from few people, but not from many. The cost of living in Moscow was very high, due to the declining purchasing power of the ruble. As the living accommodations are extremely crowded, one must accept whatever is assigned, pay the price, whatever may be asked, and then try to get better.

"While we did not actually suffer hunger, the fare at the hotels was extremely limited and monotonous. Vegetables and fruit were very scarce. The prices of food rose rapidly while we were in Moscow. We supplemented the hotel menu by food purchased at the community store at which all foreigners traded, on a foreigner's food book. These books are issued only to foreigners, and entitle the holders to purchase food in unlimited quantities, provided it is available. One makes out an order on the book one day, and takes it to the store; the next day he goes to the store and receives the food, but usually a large proportion of the items he has ordered are crossed out and he must try again. The food which can be purchased by Russians is restricted to very small quantities specified on food cards. These quantities are not sufficient to maintain vigor, and the Russians show signs of the limited diet. When I left, on August 15, they were also on a limited allowance of one cake of soap per month per person. While I was in Moscow, clothing and food were constant subjects of discussion among both Russians and foreigners. Some extra food could be purchased from private traders on the streets, at extremely high prices, but I never heard of any clothing at all available for purchase.

"After acquiring some familiarity with industrial conditions in Moscow, I was asked to write, for the benefit of various factories there, general descriptions of American manufacturing practices. Then a schedule of inspections was laid out, and I started the first one on a machine tool factory in June. There are said to be about ten plants in the U.S.S.R. building machine tools, of which four are fairly good. The others turn out a low grade product. The one which I inspected was one of the best four. Its principal product was engine lathes from 10" to 13" swing. It was also building shapers, Diesel engines, and a few other machine tools. Complaints had been made of inaccuracy in the products and of high production costs. I made a fairly comprehensive report on this plant, advising some radical changes.

"While this work was in progress, the time arrived when the decision on the renewal of my contract must be made. In view of the prospective conditions approaching — especially the decrease in food supplies, and the rising prices due to the decreasing purchasing power of the

1895 Continued

ruble, I decided that I did not care to remain another six months in the country, and so notified the chief of the department with which I was connected. Therefore, I completed only the inspection and report on the first plant scheduled, and discussed with an official of the Machine Tool Trust the steps to be taken to carry out my proposed plan of operation. He was a Russian engineer who had lived for a considerable time in the U. S. several years ago, and showed a very intelligent grasp of the plans which I proposed. I felt encouraged to believe that they will be carried out more effectively than much of the work which I saw done while I was there.

"Among the chaotic plans most of which are in too early a stage to show much progress, I found some signs of improvement. Near a large automobile factory in Moscow, I visited a building which was completed and opened in June, housing an immense swimming pool and baths for the use of workers in the factory. It is a splendid building completely equipped. Adjacent to the same factory is a community building, also opened in June, containing a large cafeteria dining room capable of feeding 3000 people, which can be converted into an auditorium seating 7000. It is equipped with microphones and loud speakers, so that the full audience can easily hear a speaker. In the same building, in other rooms schools were to be opened for workers and their families.

"I was told that Moscow had long been noted as 'the worst paved city in the world' — small round cobblestones. They are now being replaced rapidly by modern asphalt paving laid with American road machinery by an American company which has a contract for building roads and paving streets in various cities and districts of the U.S.S.R. The work is being done entirely by American crews. The streets in the center of the city have been completed, and Progress is being made on the principal thoroughfares from the center outward. At the present rate Moscow will be a well-paved city within the next year or two."

Recently we learned through M. L. Fish of Pasadena, Calif., that Zapf met with a second automobile accident. Zapf was just recovering from his first accident to the extent of learning to walk without his crutches. Bates '94 with Mrs. Bates was visiting the Zapfs for a few days when Miss Galloway, Zapf's sister-in-law, took them on an auto ride. A rear tire blew out, the car turned completely around and then rolled over. When the car turned over Bates, who weighs 200 pounds, fell on Zapf, cracking the old fracture, necessitating a return to the hospital. Apparently it never rains, but just pours. Drop him a little letter of sunshine as Zapf will be mighty glad to hear from you. Address him at 426 Walnut Avenue, Orange, Calif.

The mid-winter dinner of the '95 men in New York and vicinity will be held some time in January. Remember your secretaries depend upon *you* to keep the spirit of '95 alive. Do not disappoint them. — LUTHER K. YODER, *Secretary*, Chandler Machine Company, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

1896

The outstanding merit of the Class of '96, and especially of the individual members, has caused it to be selected for a special honor (?). A young scamp is apparently traveling around the country representing himself to be the son of a member of the Class of '96, and he approaches another classmate with a story of misfortune and attempts to secure financial aid. The fathers of this young man should appreciate the honor of having such an able and enterprising son, but in all the cases that have come to the notice of the Secretary they have repudiated him.

The first instance has already been reported in a previous issue of The Review, where the young man claimed to be the son of Dr. Coolidge of the General Electric Company, and approached Stickney and Wayne in Indianapolis. The next report came from Houston, Texas, where Howe said that apparently the same young man called on him on September 3, saying that he was the son of George Stratton, and was a senior in the Harvard Medical School. He said he had been in an automobile accident a few miles outside of Houston and although he was not injured, he was financially embarrassed. Howe says that he was a fine looking boy, well and expensively dressed in perfect taste, and wore a Sigma Chi pin and knew the password. He claimed to live in Washington, and described some of the personal characteristics of Con Young, Jameson, and Grover. He also mentioned the names of some '96 men of Course I with whom Howe happened to have been most intimate while at Technology. He was modest in his request, but Howe says he was such an accomplished liar that he imposed on his credulity and lack of sophistication to the tune of a few dollars, and that the story he told ought to have been worth ten times the amount asked for. It would have been necessary for the fellow to make several touches each day of the sum obtained from Howe to keep up his prosperous appearance. Howe is of the opinion that the man had sometime lived in Washington and had attended a medical school, or perhaps worked in a hospital in Philadelphia.

The last report to date comes from Fred Haskell Smith, who is with the Mansfield Tire and Rubber Company at Mansfield, Ohio. Smith wrote a most abject apology to W. L. Root of Pittsfield, Mass., expressing his deep regret at being unable to cash a check for Root's son when the son called on Smith in Mansfield on November 11. Smith can congratulate himself on his narrow escape from being flim-flammed, this escape being due to the fortuitous circumstances that at the precise moment when Root's alleged son called, Smith did not happen to have any supply of ready cash in his jeans. Little did he realize his luck!

It is to be hoped that all '96 men who read this will be duly warned, and will also take measures to spread the warning as far as possible, so that this young man who is apparently traveling around the country may not only fail to mulct individuals any further, but may be apprehended and brought to justice.

Formal invitations were received from Mr. and Mrs. Charles Gilman Hyde requesting the honor of the presence of the secretaries at the marriage of Hyde's eldest daughter Margherita to Mr. Allison Van Vliet Dunn on Friday evening, November 28, at eight o'clock, in the North Congregational Church, Walnut Street at Cedar, Berkeley, Calif. Due acknowledgments and Class felicitations were sent, but it was impossible for either of the secretaries to attend in person. — Vernie Peirce was reported on good authority to have been in Boston early in November, but he was very negligent in that he failed to make any contact whatever with the secretaries.

A letter from Bakenhus reported that he and Tom Desmond were present on November 21 at the inauguration of Reverend Aloysius J. Hogan as President of Fordham University, Desmond representing Technology, while Bakenhus was official delegate of the American Academy of Political and Social Science. Bakenhus was surely in good company, as Desmond is now not only President of the Alumni Association, but newly elected Republican State Senator for New York. Not having any suitable garments, Bakenhus rented a cap and gown and also a hood, which fortunately carried the official Technology colors, and as a result was accused by Desmond of wearing a hood far above his rank; but his defence was that he took what the man rented him and which he was assured was proper for his rank. Later on, in talking with Desmond personally, the Secretary was informed that Bakenhus looked very gay and could have readily passed for a person of high rank, certainly a doctor at least.

Eddie Mansfield has developed into an important educator on the staff of the Edison Electric Illuminating Company of Boston, and one of his jobs is to speak annually to the electrical students at Technology. The talk this year occurred on November 20, and his subject was "Generation and Distribution of Electric Power," but the real object of the talk was to acquaint the students with phases and opportunities in electrical work.

Henry Jackson made it a point to call on the Secretary early in the fall to report his safe return from Canada. He took his family on an automobile trip which included Montreal and various parts of the Province of Quebec. There was nothing unusual about the trip, and Henry said he did the regulation things that one usually does while in Canada. Perhaps one of the most interesting events of the tour was riding over the famous "roller coaster" automobile road which is located not far from Island Pond, Vt.

1896 Continued

Jackson also made various trips around New England with his family during the summer, four of them being to the White Mountains. On one of these they went up the carriage road to the top of Mount Washington, but not in his own car. Vermont was also included in one trip, and while the family stayed in Burlington, Jackson took the opportunity to play golf with Moat there.

The Class News has already reported the return of M. S. Jameson from Europe the latter part of the summer, and the entrance of his son as a freshman at Technology, but it was not until November that the Secretary received a call from the son, and learned much to his surprise and regret that his father had been ill with bronchial pneumonia, and had been in the Newton Hospital ever since landing. This illness started on the way back from Europe, so that Jameson was a sick man when he landed. The last report received was that he was convalescing slowly, but nevertheless satisfactorily.

Walter James as professor in the Mechanical Engineering Department at Technology is receiving favorable comment on the appearance of the fourth and thoroughly revised edition of the widely used book entitled "Elements of Mechanism" by Schwamb, Merrill, and James. Although James' name appears last as co-author, it is understood that he had the major part in making the revision. — Eugene Hultman as Police Commissioner of Boston has no news to report regarding himself, but he will be very grateful if any '96 man will deliver into his hands the long missing and much wanted Oliver B. Garrett, either dead or alive. The last report was that Gene was dredging Boston Harbor. [Since this was written, Garrett has surrendered. — THE EDITOR.]

The last item, but the most important, is that concerning the celebration of our Thirty-Fifth Anniversary, the date and place for which has been definitely scheduled for Thursday, June 18 to Sunday, June 21, 1931, inclusive, at East Bay Lodge, Osterville, Mass. Host Brown looked after us so wonderfully in 1926 that he was unanimously chosen as permanent host for future Class Reunions. It is hard to realize that 35 years have rolled by since we left Technology, but the ties that bind us are growing stronger with age. There is no question but that the old timers, who have always appeared at past reunions, will be present, but there are definite indications that we shall see some faces that we have not seen at our reunions, and it is hoped that every classmate will become actively interested in getting in touch with other men whom he knew as students, and whom he would like to see at the Reunion. We are not going to live forever, and nothing gives quite the same thrill as the sight of a face that we have not seen for 35 years. The advice which the Secretary gives to you individually is that you put down on your calendar the dates June 18 to 21 and that you begin to save your pennies and make plans, even going so far as to rob the baby's bank in order to finance yourself for that occasion. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M. I. T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1897

On writing Percy Stiles to tell us something of himself, he writes as follows: "I am leading a double life. My time is fairly divided between the Department of Physiology in the Harvard Medical School and editorial efforts in connection with *Biological Abstracts*, a voluminous periodical." — We will all be grieved to know that Jerry Danniell's wife died suddenly on November 12. Jerry Danniell himself is now at New London, Conn., with the Electric Boat Company. We all wish to extend to him our sincere regrets and sympathy.

The following was received from Rodolphus Swan on the writer's request to have him tell us something about what he was doing. "I am sorry not to be able to help you in your hour of distress, but there is really nothing I can say about myself that is worth printing. We are in the midst of a biennial municipal election with Charles S. Ashley still on the throne down here, and three musketeers trying to oust him. It behooves one, especially one in charge of elections, to walk a chalk mark, say nothing and saw wood. The only item of interest concerning myself that I know of is that in the course of eight years as city clerk and justice of the peace I have spliced 385 nuptial knots. And so far as I am aware most of the victims who have listened to my short sermons have lived happy ever after. Perhaps one reason that the record is so good is that they did not have to use all their savings for the ceremony. I will try, if I ever get a line on any '97 men, to send you something for The Review."

Not having heard from Jerry Bancroft for some period and knowing that we are all always glad to hear from him, I wrote him and received the following, which I know you will all be interested in. "I was away from home practically all of last week, and, on my return, find your letter of the 19th asking me to send you a few notes about myself. I really do not know what I can say, about my activities, that will be of particular interest to the members of the Class, as I have been pretty well occupied during the past year trying to keep things moving in spite of the business depression, and the rest of the fellows are having plenty of that kind of trouble of their own, and do not want to hear of anyone else's.

"I have had one interesting experience, however, and that is that the International Association of Industrial Accident Boards and Commissions held their Annual Convention in Wilmington, in September and I was requested to give a paper on 'An Employer's Recommendation as to Employment of Persons with Physical Impairment,' which, in my innocent way, and with a desire to be helpful, I agreed to do, and stirred up quite a lot of controversy. In my discussion, I took the position — on which all Workmen's Compensation Laws have, so far, been based — that the problem was an economic one and not social, and, much to my surprise, I found that many of the members of Accident Boards and Commissions, apparently, with a tendency of the times, are approaching the problem from that of the social rather than the economic point of view. Those of the members of the Class, who have anything to do with Workmen's Compensation, should become interested in this problem and use their influence to see that individuals, who are not carried away by their sympathies, are appointed to the administrative positions in such commissions."

Our old friend Proctor Dougherty, on being solicited for news, sent in the following bit of information which I know will be interesting to all of us. "On November 19 occurred the Annual Dinner of the Washington Society of Engineers at the Mayflower Hotel. It was in celebration of the Twenty-Fifth Anniversary of the founding of the Society, and had a special interest for '97 men. Commander Frederick A. Hunnewell '97 of the U. S. Coast Guard presided as President of the Society. In the large gathering were many Technology men so that it almost appeared to be a Technology dinner.

"Frederick H. Newell '85, President of the Research Service, who was one of the charter members and its second President, made a most interesting address on the opportunity of the engineer to help solve some of the big problems of the day. The Hon. Clyde Kelly, member of Congress from Pennsylvania, spoke of unemployment, the lack of an equal share in the world's goods, and the necessity to distribute wealth and the products of the land so as to better eliminate unemployment. The Hon. Thomas E. Campbell, Ex-Governor of Arizona and President of the U. S. Civil Service, stated that the trained engineer was coming to be the best kind of man to have in Government service and so help build up an efficient Government personnel.

"Marshall O. Leighton '96 was called upon to say a few words regarding his early days of service as one of its former directors. Among the Technology men present were the following: J. W. Clary '96, W. M. Corse '99, W. C. Dean '00, Capt. W. E. Parker '99, L. B. Freeman '24, N. C. Grover '96, A. M. Holcombe '04, and Commander F. W. Southworth '00."

Henry W. Ballou, on being requested to tell us something of his trip abroad this summer, wrote the following, which seemed to the writer so interesting that it should be given in full. The letter follows: "Complying with your letter of the 19th, I do not feel that my trip abroad was sufficiently unique to warrant space in The Technology Review. There were, however, several features that seemed to me worthy of consideration by our countrymen. It is most impressive to see extensive and well ordered forests in various countries, notably Denmark and Sweden, where a private citizen may not cut a tree on his own land except by the

1897 Continued

advice and consent of a government official. I wish that the people of these United States could be continually reinformed of the sad fate of large tracts in Asia and Northern Africa, that were once wooded, and of the contrast between portions of our own country and such countries as Denmark and Sweden.

"While in Copenhagen I spent a day in the huge plant of Burmeister and Wain, employing 10,000 men. The most notable feature of the plant to me was a circular iron foundry, the exterior appearance of which was like a huge merry-go-round. The traveling cranes are radial in position and travel somewhat like the spokes of a wheel, except that several of them can pass each other when loaded. This arrangement of an iron foundry leads to the utmost possible economy of travel of men and material. But, for our country at large, the most significant feature was that of the diesel engine for marine use. It appears that Burmeister and Wain have furnished diesel engines for about 1,000 commercial vessels, which is about equal to the production of the entire rest of the world put together. A census of world shipping under construction this year shows that 65% of all the tonnage of the world under construction, is to be equipped with diesel engines, but that only 15% of construction in progress in the United States, is to be equipped with diesels. It looks very much from these figures of unquestionable authenticity, that our country should wake up as regards the use of marine diesels.

"A public bath in Berlin was exceedingly interesting because of the artificial surf. A huge paddle actuated by an electric motor located behind a screen at the deep end of the pool, produced splendid waves which traveled the length of the pool and broke on the shallow beach-resembling end in a most attractive fashion. Berlin is an interior city, far from any surf; but here was an artificial surf giving life and activity to a public bath and replacing the somewhat sodden and dead aspect of the ordinary swimming pool. It clearly has many advantages, among which are keeping the water well churned up and insuring a thorough mixing with the disinfecting chlorine. I wish that all cities in the United States, contemplating public swimming pools, could be thoroughly informed regarding this pool with artificial surf, at Berlin.

"I also wish that all Americans could see the vast aviation field of Berlin, and its many attractive attributes. Extensive restaurants and appurtenances to enable the public to observe the arrival, departure, and management of aeroplanes, results in making this flying field a popular resort for a large daily attendance of persons not directly participating in aviation. In short, the aviation field has become a popular resort of marked attractiveness for the common people.

"Several mountains in Europe higher than Mount Washington, may be pleasurably ascended by cableways, the scope of which was, to me, surprising. A car traveling on the cableway may carry 15 or 20 people, and the distance between towers may be several thousand feet, so that one gets a thrill comparable to that of airplane travel, available to those who fear the risk or cannot afford airplane travel. The grand sweep of these cableways over forests and precipices is a never-to-be-forgotten experience. I feel that Europe is ahead of this country in the use of such devices for putting the ascent of high mountains within the reach of the ordinary purse and of those of physical condition unsuited to vigorous mountain ascent. The highway engineering in the Alps, whether German, Austrian, Italian, or Swiss, is impressive and would certainly be an inspiring sight to our highway engineers concerned with rough country. In the course of 12,000 miles of travel during three months, I visited seven countries, not including France, and was impressed with the friendly attitude which I found well-nigh universal. My experience makes me loath to feel that there is any real hostility broadcast amongst the people of those European countries toward America."

I know that we will all be interested to hear from W. O. Sawtelle, whom we had such a hard time locating in the spring, to hear that he is still alive and well although he has changed his work. His letter follows: "Your letter has reached me. Am just back from Maine for the winter. What do you want? An obituary notice? A bit early for I'm still in the ring and the show's going on. Strong for the right and all that sort of thing. Since getting out of the teaching game which I did at the close of one war, I have been delving in historical research work. Publishing a few things once in a while. My especial hobby is Acadia, Nova Scotia, and Eastern Maine.

"My scientific connections (of course we couldn't let go all of them now) comprise membership in the Franklin Institute, Committee of Science and Arts, and a place on the board of trustees of the Wagner Free Institute of Science. Boston seems a bit out of the way for me now as I usually go to Maine direct from New York to Portland. It certainly is years since I have seen any of the lads, but I have not forgotten the good times we used to have. You must be quite an old man now; but as for me, I am never going to grow up. I came to that conclusion at Osterville in 1912."

Oswald Herrick, who some years ago was joined in holy matrimony, sends the following which is most interesting: "I was glad to hear from you although your request for a write-up on how I am enjoying married life is a poser, because the honeymoon stage has been unusually prolonged, and consequently I am inclined to praise the institution possibly beyond its merits. Suffice it to say that husband and wife are doing well. We've done considerable traveling in South America, Italy, France, Bavaria and the Tyrol, which may have helped to make life exceptionally colorful.

"I haven't much to add — except that my book, 'Building Concrete and Stucco Houses,' has gone into a third edition, and a later tome, 'Economy in Home Building,' into a second. A third book, 'Designing and Building the Chapter House,' is about to go to press. I am still editing the Delta Kappa Epsilon *Quarterly* which appears to be growing in popularity — even the *American Mercury* handing us a bouquet in its October issue. I rarely get to Boston, but if I do, I'll certainly let you know, and if the Rib is with me we'll be glad to accept your hospitality."

Our old friend, Charles Ewing, who has been doing architecture in New York for so many years, has recently opened a home in Newton and goes back and forth every week to and from his office in New York. He writes that while he cannot think of anything interesting to say, he hopes to see us all in the near future, but as far as giving us any knowledge of himself, he says that he belongs in the missing column. — You will all be interested to hear that Mr. and Mrs. Harry E. Worcester are taking a combination business and pleasure trip in England and expect also to go to the Continent. They left Boston about the first of November and are planning to be back here in time for Christmas.

R. G. Hall spent considerable time during the summer at the Errington Mine in the Sudbury district of Canada, acting as consultant on their metallurgical problems. He is now located at 795 Sutter Street, San Francisco. — Thomas R. Weymouth has resigned as chairman of the board of the Oklahoma Natural Gas Corporation to become Vice-President of the Columbia Engineering and Management Corporation of New York City. Mr. Weymouth was recently elected a Vice-President of the American Society of Mechanical Engineers.

The Chairman of your Executive Committee recently sent out a S.O.S. to your Secretary to send him something about himself and his work to fill out the columns of the Class News. Now I ask you, what can a person who has been connected with the same corporation, and that corporation a textile one, for 32 years write that would be of interest? Who has a good word for textiles these days? For several years now they have said that the turn for the better was just around the corner, but for those same several years we have done our best to catch up with that corner so as to get around it; but the darned thing is still several laps ahead of us yet. However, we are still in active operation, which is saying a whole lot in textile circles just at present. Here in Lawrence there are many large factory buildings, formerly humming with the music of the spindle and loom, that are silent and empty. Others are given over to the manufacture of shoes, radio tubes, and even caskets. I hope there is no sinister meaning in the latter. If you prosperous and opulent classmates of mine would only open up and buy a few more suits each year for yourselves and your wives, perhaps my story would be happier. But hope springs eternal, you know, and just at present we are banking heavily, if not exactly on

1897 Continued

eternity, at least on the near future. And say, don't forget that extra suit. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass. CHARLES W. BRADLEE, *Acting Secretary*, 261 Franklin Street, Boston, Mass.

1899

A recent issue of *Combustion Topics* carries the notice of resignation of Edwin A. Packard, manager of the Patent Department of International Combustion and affiliated companies effective November 30. Packard has accepted the position of patent attorney for the Permutit Company, 440 Fourth Avenue, New York City, manufacturers of water softening and water treating systems. He is recognized as a skilled counselor of patent procedure and his success in guiding the patent policy of the International Combustion companies through all of its ramifications is evidence of his ability and breadth of experience.

Arthur Hamilton writes from Sugar Hill, N. H., that he is building stone walls, mulching shrubs, and interested in his small farm. Perhaps he will tell us more about this later. — Your Secretary has just received notice of the death on October 27, at Neenah, Wis., of Henry Kimberly Babcock.

We have in mind a Reunion of the Class of '99 next June, and have made reservations at Yama Farms, Napanock, N. Y., for June 1, 2, and 3. Members please notice and keep the date in mind when planning trips. Heretofore Reunion week has conflicted in many instances with graduations of our sons and daughters, therefore your Secretary has tried to select a date which would not interfere with those momentous occasions, though he has been limited somewhat by available dates at the various resorts under consideration. Yama Farms seems to be the most suitable and convenient from every standpoint, and we are planning a splendid Reunion. — W. MALCOLM CORSE, *Secretary*, 810 18th Street, Washington, D. C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

1900

A pleasant reminder of the Reunion days at the Cape in the shape of a crate of cranberries arrived recently from our old friend Crowell, the cranberry king of Dennis, otherwise known as the golf champion of the Class. Thanksgiving was made more enjoyable in the home as a result of his thoughtfulness. — E. H. Davis in writing of his European trip brings out one little picture that would have been interesting to look at. His rendition of a solo entitled "Take Me Back to Tech" in a concert on the boat nearly wrecked the whole outfit in mid-Atlantic.

Frank Cady, who went abroad this summer with his wife, writes as follows: "For our first adventure in foreign lands we decided on a regular tour of The Students Travel Club as offering the greatest variety in the way of countries and places visited for the fixed sum we were prepared to spend. Freed from all responsibility except for our hand luggage, money, and passports, we sailed from Montreal, June 13, and landed at Glasgow. Here we had an afternoon's motor trip to the Bobbie Burns country. After a day spent in going, via steamer, tallyho, and motor bus, through the Trossachs, we came to Edinburgh and with an excellent guide made a tour of the city. Then followed a four day tour by motor coach through the English lake region to London where we stayed three days, including a trip to Hampton Court and Windsor. We went to the Hook of Holland by boat from Harwich and visited the Hague and then on to Amsterdam. At Beock we saw them make Edam cheese and on the Isle of Marken saw the quaint costumes for which its people are famous. A day in Brussels, and stop-over in Cologne to see the Cathedral brought us to Coblentz where we happened to see the Graf Zeppelin as it flew over the city. Up the Rhine to Biebrich and to Wiesbaden justified the eulogies we had heard on this region. We spent a day in Heidelberg and then went to Oberammergau via Munich. Of the Passion Play and accompanying experiences I could write a chapter. It will never be forgotten. We continued to Innsbruck and on to Lucerne with a day in each and left the latter by motor bus over the Furka and Grimsel passes, the former in a blinding snowstorm on July 13. Then came Interlaken, Montreux, and Stresa via the Simplon tunnel, and Venice with a stopover in Milan. After two days in Florence we went to Rome for a four-day stop. Then to Genoa and to Nice where we visited Monte Carlo and had a swim in the Mediterranean. With a stop-over in Avignon, we reached Paris July 28, and stayed there until August 9 when we sailed from Cherbourg for Montreal. Everywhere we had the best of guides and generally motor busses to see the sights and tour the cities."

Price writes in as follows: "I have never been able to submit anything to the Class Secretary which seemed to me worthy of taking up any space in 1900's allotment in The Technology Review. However, since I am always awfully interested to read the items about the other fellows, I concluded that I would send this information along to you to use. I have been 19 years with the Irving Iron Works Company, originators of steel mesh flooring and steps and steel mesh armoring for floors, bridges, and highways, and for a number of years past have been Treasurer and General Manager. They have now made me Vice-President and Chief Engineer in charge of research and development and whereas I formerly spent most of my time at the home office in New York City, my new duties will require me to spend most of my time out on the road contacting with our 30 field sales representatives throughout the country and also with customers, prospects, installations, and so on. This change will, I hope, enable me to meet more of the fellows during the course of a year than it has ever been my privilege to do before." — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

1901

Since my last letter we have had a Class meeting! And there were seven people present. This is a cabalistic number and I hope it augurs well for the future. Several of the faithful ones were missing, but Willard Dow, Ted Brigham, Winthrop St. Clair, Charlie Dennison, and George Anthony Hall constituted a solid phalanx. In addition, by the best of good luck, Klieves, who has a daughter at Wellesley, happened to be in Boston on just that day and was promptly enlisted. Your Secretary made the seventh. George Allen wanted to be there but wrote that he was on jury duty — this I assume to be an alibi should anyone see him about the Court House. Charlie Record with his usual oriental sinuosity left his decision open, while Frank Holmes committed himself to the extent of saying he would be there if he could. Schlesinger had to cancel at the last minute while Teddy Taft coyly pleaded an important engagement. Howard Chandler and Carr, together with our yachtsman A. H. B. Arnold, were all unable to make it. I recount the names with pride as this constitutes an honor roll, and there remains yet one more; Jack Scully was also away but sent word to that effect. Noble fellow! We debated the various questions relating to the Reunion, the first of which patently was where it was to be held. Loring Danforth had recommended Yama Farms and your Secretary had the pleasantest of recollection of several visits to that sylvan resort, all, however, before the country at large became superficially desiccated. In spite of earnest efforts on my part, I failed to excite any real enthusiasm.

Dennie had written in to tell us about the oasis that he has established in the Maine desert — not the island by the way — but the Class seems to be domestically-minded and feared to wander so far from the domestic hearth. The several Wianno resorts were canvassed and while each presented a variety of attractions, none assumed a dominant position. Then some brave soul crossed the Rubicon and suggested Oyster Harbor or Harbors — I know it to be singular and it may be plural. This is the little South Shore paradise which lays down as a basic rule that you must bring a wife — with unconscious unconvention, they usually say "your wives" — if you wish to enjoy the attractions of this lovely spot, the suggestion seemed to strike a responsive chord. Several of the men present with the sheer courage standing out in beads on their pallid foreheads stated that they would like to bring their wives to the party.

Your Secretary must confess that he found himself in a technically unenviable situation. Even that kindly soul George Anthony Hall broke the habit of years and offered a gentle chiding for my benighted and unbenedicted state. I don't see what I can do other than to effect a temporary loan and I have engaged additional clerical assistance in my office to take care of the increase in correspondence

1901 Continued

that I feel sure will be evoked by this announcement. It looks as if we were going to Oyster Harbor although the die is not yet cast. I suppose I could do my bit rocking in a little boat on the limpid waves just off the veranda if I am unable to meet the first requirement for participation. It's a pitiful picture. I am sending out a Class letter in the near future to place a number of questions before you and I await with interest the expression of the consensus of opinion. Your own vote will go in a plain envelope and be unsigned so that you may exercise your suffrage with absolute freedom. Data concerning the loan, if you are in a position to make one, will go on the pink slip and the facts there recorded will, of course, be strictly confidential. I should like a photograph, a brief description of habits, and disposition, and a frank statement as to shortcomings. There are some of you, at least, who will sympathize both with my present difficult situation and the crisis in my affairs which seems to be impending. When you get the letter and questionnaire, sit down, sharpen your lead pencil with your teeth — original antique or recent reproduction — and answer the questions therein contained. After your name and replies have been coded so that the identity cannot be traced, the original communication will be burned. I shall retain only one of the photographs and that solely for purposes of identification. Blemishes should be carefully described.

I pause for a moment from contemplation of the orgy in prospect to mention a few facts. Bill Farnham is still holding down his job as local traffic engineer of the American Tel and Tel Company in New York. — Austin Hyde continues with the Calco Company at Bound Brook, N. J., while Edwin F. Church still professes mechanical engineering at the Brooklyn Polytechnic Institute. — From the ever faithful Philip I learn that Francis W. Puckey who presents several claims to fame in addition to his membership in the Class of '01, has just become a director of the University Club of Chicago. — Also I got a nice chatty note from Sol Stone who writes with engaging candor that he is just doing the odd jobs that aren't wished on someone else. Sol is coming to the Reunion and expects the Buffalo contingent will also contain Natt Patch, Loring Danforth, and George Fisk. In view of the social dilemma which with the best of taste I have touched upon above, I think I can do no better than to quote a part of his letter.

"Just returned from a week-end visit with Solon, 3rd, who is in his second year at Virginia Military Institute and realize, more than ever, that it wasn't at all necessary to send him down there to make a better man of him than his Dad. He always *was* that. Now that he is a six foot twoer I sure do know it. Some boy, Allan. Hope yours are the same." Now do you suppose he doesn't know any better or is he just trying to embarrass me? And to use a plural verb! Some time in June somewhere on the South Shore of the old Bay State, I am going to find out about this. In the meantime a dignified silence is the indicated rôle.

Well, before the next letter is written you will know all the sordid details of the Reunion. I shall await your replies with a personal interest. — ALLAN W. ROWE, *Secretary*, 4 Newbury Street, Boston, Mass.

1905

The discovery that Oscar Merrill could write A.B., Sc.D., S.B., after his name started a search which disclosed that Herman Gammons had acquired LL.M., L.P.M., S.B., while George Jones varied it with LL.B., M.P.L., S.B. But unless Charlie Clapp has made the usual president's collection, Gordon Bill has the prize package: A.B., A.M., Ph.D., A.M. Incidentally Frank Chesterman has an Eng. D. which may be a new degree or an old building. — Dan Harrington is Vice-President and member of the executive committee, E. I. duPont de Nemours and Company, Wilmington. — Ernest Harrah has no address. Can anybody give him one? — Phil Hinkley is another yachtsman, sailing around Portland, Maine. At other times he is Secretary of the S. D. Warren Company, Boston. — In our November notes it was explained why the Reunion report did not get into either the July or October numbers of The Review. The explanation somehow got lost in the process of production.

Bill Motter and Fred Goldthwait have both been recently presented with baby girls. Bill's first, Goldy's fifth. — One day in November, Sid Cole telephoned your Secretary from the main street of Middletown to say that he was in such a hurry that he couldn't drive up the hill. Wasn't that a deuce of a note and why did he waste the nickel? — Course III did a lot of crowing at the Class Dinner in June (Charlie Johnston was there), but a recount gives Course II thirteen while Course III gets ten. — Bert Files who has been operating New York office buildings for the Cross and Brown Company for some years, is now running their Boston office at 201 Devonshire Street.

With a nice sense of the appropriate, The Review Editors brightened the November cover with a picture of the yawl *Ketch Dorello II*, a boat almost able enough for the Bermuda Race described in our notes in that issue. — Frank Riley is President of the Riley Loom Corporation, South Boston. Another president. — A picture of the new officers of the Massachusetts Golf Association recently appeared in the Boston *Herald*. Front row, left to right: Henry A. Wentworth, Secretary-Treasurer. — Sam Seaver is manager of the mining department, Canadian Pneumatic Tool Company, Ltd., with offices in Montreal. — Sam Shapira, recently returned from Russia, is now back in Boston. His address is 1945 Commonwealth Avenue. We would like to get another story from him. A couple of years ago he wrote us a most interesting account of his experiences in the U.S.S.R.

Claude Anderson gives us another generous report from the Philadelphia district. "I left the Ilg Company about August 1, 1929, and now occupy the anomalous position of being a substantial stockholder in that company and the district manager of a competitor. The company wanted to move me to Chicago where I was unable to see an advancement very soon and where they proposed, I disposed, and sent in my resignation. With no delay, I accepted the offer of a similar position with the Johnson Company also of Chicago. This is a younger company but much more progressive than Ilg and has a considerably wider line and goes into far bigger equipment. I have tackled a real job, especially with business at such a low ebb, but believe I shall be able to make a real go of it.

"As for other Technology '05 men here, you know there are few hereabouts. I see Ammen at times on the train going in or coming out from the city. He still follows patent law and has an office in the city. C. A. Emerson I see quite frequently either at lunch or on the street. He is still in the sewage disposal 'racket' — providing there is such a thing. Emerson is one of the fellows of the Class who, I think, has real ability. He always has impressed me with his broad fund of information and keen thinking ability. I know he is active in the Engineers Club in Philadelphia and has done important work in his line. Had a pleasant chat recently with Piggy Bartlett who still is chemist for Campbell's Soup Company in Camden. Bartlett will be glad to read in print that he has changed but very little physically in the last — years. I hate to actually call it 25. What I mean is that Bartlett retains his pristine vigor and boyish form.

"Regarding Sid Caine, I was rather shocked in this last number of The Review to read in your column that he had left Roxborough. This morning while driving up country I stopped at St. Timothy's (which was his church) and learned from Father Dennison, his successor, that Sid left last November and that his present address is 9 South Russell Square, Boston. I feel rather guilty for not having tried to see him oftener as his church was only ten minutes' drive from here. Blakeman, I believe, is still with the Equitable Life in Baltimore, but have not seen him for some time. Have heard nothing further of Paul Ralph since my last report when he was living on a farm outside of Trenton, N. J., raising chickens as a specialty. Have been busy outside of business with certain work of a more or less charitable nature and for the last four months indulging in the public speaking course at the Engineers Club. And as I am making use of this Sunday literally as a day of rest, am not in the mood to compose anything like the colorful descriptions some of the fellows have. They are real gems — some of them."

Once more we sadly record the loss of a classmate. Bob Farrington died at the Waltham Hospital on November 4, of injuries received when his automobile skidded into a truck on the Boston Post Road in Wayland. His wife, who was with him, escaped serious injury. At the Institute, Bob was in the Tech Show of

1905 Continued

1902 and was a member of the track team for three years. He was second in the All Round Contest of 1903–1904 and, in his senior year, was the best high jumper in Technology. At the New England meet at Worcester, he placed second in the high jump, third in the pole vault and ran in the high hurdles. After graduating, he attended Harvard Law School for two years and then went into real estate. For many years he has been a member of the firm of Holdsworth and Farrington at 30 State Street, Boston. He was a director of the Massachusetts Real Estate Exchange and a member of the Exchange Club, B.A.A., University Club, and Winslow Lewis Lodge, A. F. and A. M. Bob ran the last Reunion at Oyster Harbors and did it extremely well. As another so well put it, "Bob was a cool, laconic, efficient sort of a chap, always ready to help, and '05 loses a friend." — ROSWELL DAVIS, *Secretary*, Wesleyan Station, Middletown, Conn. SIDNEY T. STRICKLAND, *Assistant Secretary*, 20 Newbury Street, Boston, Mass.

1907

As the Secretary was glancing through the rotogravure section of the Boston Sunday Herald one November Sunday, he noticed the photograph of a fine looking girl, and upon examination read the following comment: "Miss Elizabeth H. Hosmer who made her formal bow at a tea with dancing at the Concord Club on October 11. She is the daughter of Mr. and Mrs. Herbert B. Hosmer of Concord." We suppose this must be our own Hos. — On November 25 Harry Moody appeared at the Boston office of the Secretary and we spent a delightful half-hour together. Harry is general sales manager of Edge Moor Iron Company, Edge Moor, Del., manufacturers of water tube boilers and his situation is such in the organization that he is very happy and apparently has opportunity for a very successful future. Harry's trip to Boston was partly on business, partly to see his son, who is a freshman at Technology, initiated into his own fraternity, and furthermore, when he left me, he was on his way to meet his pal and our inimitable classmate Oscar Starkweather.

Hugh Pastoriza is associated with Coffin and Burr, Inc., investment bankers at 26 Broadway, N. Y. He went to England, he writes, in the summer of 1929 but did not see Tresnon, also "nearly to Russia but did not see Kolaschefsky." A third son arrived in his family on November 30, 1928. — Speaking of children, Harold Reed and his wife of Wellesley, Mass., adopted twins (both boys) in November, 1930. No children having previously been in the Reed home, we understand that Harold has had to make some radical changes in some of his plans of home life. His business office is at 50 Oliver Street, Boston, circuit traffic engineer with the New England Telephone and Telegraph Company. — BRYANT NICHOLS, *Secretary*, 2 Rowe Street, Auburndale, Mass. HAROLD S. WONSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

For the first time for several months we did not have any Class Notes in the last number of The Review. How many of you noticed it and took pity on your Class Secretary, whose job it is to prepare these notes? It is not too late now to send in a few words about yourself or some other classmate. — Here's what we have picked up this month: David P. Marvin, formerly Instructor at the U. S. Coast Guard Academy at New London, Conn., has been promoted to the rank of Lieutenant Commander. He's still located at New London.

Francis H. Soderstrom, superintendent of the Bunker Hill Mines Company at Tombstone, Ariz., has moved his family to Bisbee, Ariz., planning to make trips to the mine as occasion demands. The Bunker Hill properties are operated largely by lessees. — Tom Desmond recently had the distinction of being the only Republican to carry Sullivan County during the recent election in New York state. Tom was elected Senator for the Orange-Sullivan district. — In a recent copy of the Boston *Transcript* appeared an interesting article on Hugh Lofting's new book, " The Twilight of Magic," which has just appeared in the book shops. Lofting was the author of the well-known Doctor Dolittle books previously referred to in our Class Notes.

Although his latest book "lacks the delicious nonsense of the stories of Doctor Dolittle, of his adventures in the Moon, of his Caravan and his Zoo and all the charming absurdities associated with that amazing personality, this tale of the twilight of magic, of king and castle, knights and beauteous damsels, has a humorous charm of its own. It is a delightful story, so cleverly written that it envelops us in the atmosphere of medieval times and we quite forget that this is the Twentieth Century, with electricity, motor cars, flying planes and smug forgetfulness of the glories of the past, and live for a brief space in a world full of magic, of witches and knightly adventures which are always lurking just ahead to lead the way to glory." — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. PAUL M. WISWALL, *Assistant Secretary*, General Foods Corporation, 250 Park Avenue, New York City. MAURICE R. SCHARFF, *Assistant Secretary*, 19th Floor, First National Bank Building, Pittsburgh, Pa.

1910

Strange as it may seem we have a few Class Notes for this issue, proving that your Secretary isn't dead, even if he is dead broke, like most everybody else these days. — Charlie Almy writes as follows: "Three things have combined to keep me rather unusually busy this year. First, we are devoting a great deal of effort to the merchandising of our new line — Darex soles, a sole for business and sport shoes in the upper price levels. As you know, Dewey and Almy Chemical Company have for years specialized in latex products, and Darex soles are made by impregnating a suitable felt with latex. They are wonderful insulators against heat or cold, are long wearing, waterproof, non-marking, and absolutely slip proof on a wet deck or a sun baked golf course. Concerns like Abercrombie and Fitch, Nettleton, Best and Company and so on have taken them up already, and we feel that we are making splendid progress.

"Secondly, last spring our company took over the Multibestos Company in Walpole of which I was made President. Through them we are marketing another recent development of our laboratories, latex bonded brake lining and clutch facings under the trade name Multibestos LX, and these are meeting a most favorable reception. Thirdly, we have this fall organized an English subsidiary, Dewey and Almy, Ltd. I haven't been abroad this year, but with subsidiary companies in England and Germany and a branch factory in Italy, I expect to go over next spring to see at first hand how our European sales are progressing."

The month's grist also brought a letter from Maurice P. Anderson on the letterhead of the Anderson Supply Company of which he is President. They are photo supply merchants in Seattle, Wash. The letter reads as follows: "I have your circular letter of October 31, and I am certainly ready to admit that while I never send in any Class Notes, I always look for them in The Review. I have not made a business change since 1911. However, I have had some diversion the last two or three years in long distance power boat races. The first race was held from Olympia, Wash., to Juneau, Alaska in 1928, the distance being practically 1,000 miles. With tidal currents listed as high as sixteen knots in the current tables, and several open stretches in the Pacific, a 32-foot boat saw plenty of action. This year's race was shorter, from Seattle to Prince Rupert, B. C., which is just south of the Alaska line. The distance is approximately 700 miles. It is really remarkable that as many as ten or fifteen entries can be secured in these races, and it is more remarkable that, insofar as I know, only one boat has failed to finish in the three years.

"I recently received a wedding announcement involving my old Technology roommate Horace Stump. While in school Horace and I decided to wait until we were 40 before we committed matrimony. That resolution went within a couple of years so far as I was concerned, but Horace had the temperament to stick it out."

The Thompson and Lichtner Company, Inc., Boston, sends out the following: "We are pleased to announce that Gorton James has joined our organization as Director of Marketing. Mr. James until recently was Marketing Editor of *Business Week* and previously was chief of the domestic commerce division of the U. S. Department of Commerce." — Ted Whitney has been with Whidden-Beekman Company, builders, since he graduated and in 1922 he organized the Whidden-Beekman Engineering Company. He has just changed the name of the

1910 Continued

company to the Whitney Engineering Company. Ted is an authority on electric welding, and has promised me an article of his on the Edison Building in Boston, the first steel frame building to be put up in Boston without rivets, on which he was consulting engineer.

I hope this set of notes will encourage some more of you to write in. I am sending in these notes to The Review office on November 25. Anything coming in after today cannot be published until February, so don't conclude that your communication is lost if it doesn't appear in the next number of The Review after you sent it in. — DUDLEY CLAPP, *Secretary*, 40 Water Street, East Cambridge, Mass.

1911

Gratifying indeed are the advance indications of a large and enthusiastic attendance at our Twenty-Year Reunion up here at Douglas Inn, Douglas Hill, Maine, June 26 to 29, 1931, as evidenced by notes accompanying checks for Class dues. We have just finished disposing of our good-sized apple crop and the weather up through this last week in November is so extraordinarily fine that we are still able to do much outdoor work, ofttimes of necessity postponed until spring. Thus everything will be in wonderful shape for our party in June and you must come over!

Belated news reached us earlier in the month of the tragic death of Nate Prentiss, I, who was with us during the early part of our Technology career. He was killed in an airplane crash on August 1, while in the performance of his duties as transport pilot near his home in Brookfield, Mass. — Contrasted with the sadness of this story we have the joy of one of our classmates, John Dunphy, with us in our freshman year, who was married on August 9 to Miss Dorothea Mae Corcoran in Saint Aiden's Church, Brookline, Mass. The couple traveled in the southern states in September and October, and will make their home in Brookline, we are told.

Don Bakewell, II, writes from Sewickley, Pa., that he hopes to be with us next spring and adds: "My old company, Duquesne Steel Foundry Company, went into a merger last June and I'm now Senior Vice-President of the new company, The Continental Roll and Steel Foundry Company. I did all I could to get a Democratic wet Governor for Pennsylvania, but it didn't seem to take outside of Philadelphia." — Royal Barton also hopes to attend, but said he is so busy with his work as analyst of rate department of Electric Bond and Share Company in New York that he hasn't any news to add. — Stacy Bates, II, erstwhile apple raiser at Concord Junction, Mass., who is now in law at Ventura, Calif., writes that he regrets that attendance "is not on the cards though I am getting to the point when it will be impossible to delay getting a look at New England again." He adds that he found some years ago that apple raising, though delightful, was not highly remunerative, so he entered and graduated from Harvard Law School, "and since that time have been practicing law here in Ventura with every measure of success that could be expected of a newcomer to the game." More power to you, Stacy!

Phil Caldwell, I, now Vice-President of Robertson Paper Box Company at Montville, Conn., hopes to attend and wrote that when my farm plans branch out to poultry and egg production on a large scale, he would like to see my layout and methods "as I used to fool around with hens as a hobby and hope sometime to have a little farm on the side." — Jim Campbell, I, likewise hopes to attend with friend wife and wrote that their daughter, Jean, was now at the Mary A. Burnham School in Northampton, Mass., "preparing for Smith or something." — Likewise Marshall Comstock, VI, and his wife are making plans to attend and we are certainly glad to report that their six-year-old boy has now quite recovered from a serious appendix operation.

George Cumings, also VI, is one of the bachelors planning to attend, but next alphabetically in the class is A. T. Cushing, I, senior valuation engineer, U. S. Department of Agriculture, Kansas City, Mo., who writes: "Afraid not. Do not get East so often now since both father and mother died." — Then come the Cushmans, L. D., IV, and Paul, VI, and they both are planning to attend. Lester, you know, is mechanical engineer with James H. Ritchie and Association, Boston, while Paul is professor of mechanical engineering at Vanderbilt University, Nashville, Tenn. He and his wife motored to Oregon and California the past summer "to see how things had improved since I used to work in San Francisco. The smoothly paved highways of Tennessee were a relief when Memphis was reached on the return trip." He adds, "The number of mechanical engineering students at Vanderbilt has trebled in two years, but I am never satisfied, and am now working to make more laboratory additions by installing a G. E. dynamometer, several airplane engines, a Diesel engine, and other apparatus. I am teaching thermodynamics, airplane design, management, refrigeration, and internal combustion engines at various times during the year, besides scheming up improvements of all sorts." Thereby earning a vacation annually, we'd say!

It's nice to hear from B. Darrow, VI, from Akron, Ohio: "We all rather miss you on your old beat." B. hopes to be here in June, as does George Forristall, II, business manager of the Houston *Gargoyle*. — Louis Golden, VI, from whom we haven't heard for ages and who is now with the Kennedy Company, Providence, R. I., says he is putting the date down and as a result of the notice "reminiscences are crowding one on another and it will indeed be a pleasure to see and talk with you once again."

Ban Hill, I, public-spirited Baltimorean, has high hopes of attending, also. He has just written a little book, "Financial Dynamite," a copy of which he thoughtfully sent to your Secretary with this note: "You have all probably read in the papers about the Baltimore Fare Case. It may interest you to know that your classmate was the original man in this case to propound the theorem that if a valuation is based on present day value then depreciation allowance must have the same basis. To put it more simply, if a company has an electric car which cost $10,000 and must be replaced with a new one at $15,000, the new one having no more earning power than the old one, the company will be in a very unfortunate position if it has collected only enough to pay for two-thirds of a new car. This case was finally decided by the Supreme Court of the United States last January. Right now I am chairman of the committee of the Engineers Club of Baltimore, which is working with the State Commission on the problem of crossing Chesapeake Bay, five to ten miles of deep water, with a bridge or tunnel."

Bob Mather, VI, says, "Your invitation appeals — wish we could go now. Think we can make it." — Bart Nealey, I, says he's going to drop in for a day or two on his next trip to Maine. He may not be able to be here in June as he "will have to go to Alaska to look after some of my interests there next spring." Bart, you know, is Director of Industrial Publicity of the American Gas Association, with headquarters in New York City. — Chet Pepper, II, and his wife plan to attend as do Hal Robinson, I, and his wife. Hal writes, "My wife says, 'let's go!' so sign us up for Reunion." — Don Stevens also expects to be here and says he's "glad to see it set for Douglas Inn."

H. W. Van Hovenberg, XI, sanitary engineer for St. Louis Southwestern Railway Lines at Texarkana, Texas, hopes to attend with his wife and possibly their daughter, Nancy, now at school in Washington, D. C. He adds: "Never see any '11 men down this way, excepting as they come down occasionally for a bit of God's tonic in our wonderful country. Bill Orchard was in Fort Worth in early November so had pleasant visit with him, but all too short. Same old Bill and — 'nuf said!" — Louis Wetmore, IV, who practises architecture in Glens Falls, N. Y., hopes to attend and says the place looks most attractive.

Chairman O. W. Stewart, I, has the boys on the Reunion Committee (Obie Clark, Carl Ell, Carl Richmond, and Dennie and Jack, ex-officio) hard at work on plans and in particular attempting through geographic distribution to stimulate attendance. We'll be ready for a big crowd up here in June and you will make a big mistake if you don't make that memo right now: June 26 to 29, 1931, attend 1911 Twenty-Year Reunion, Douglas Inn, Douglas Hill, Maine. — ORVILLE B. DENISON, *Secretary*, Douglas Inn, Douglas Hill, Maine. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

Happy New Year! This year's first good resolution: to begin planning now to attend the Twentieth Anniversary Re-

1912 Continued

union of your Class, which takes place in 1932. — B. H. Morash, VI, had been in Boston for nearly a week visiting relatives before he let your Secretary know that he was hereabouts. As he was leaving the next day I only had the opportunity of seeing him for a few moments, but can report that apparently his enforced rest has put him in good condition, for his pink complexion looked much as it did some 20 years ago. Morash has gained nearly 15 pounds, and feels that he will be fit to get back into harness after his visit to Boston. I had the pleasure of meeting Mrs. Morash and the young son who is nearly three.

Dave Benbow, II, has burst into print in the November issue of *Factory and Industrial Management* in an article entitled "Your Product Overseas." This issue also contains a very favorable editorial comment on Dave's article. On reading this I wrote Dave and asked him for a little news. Apparently his pen was in good working order, as he submitted the following from Reading, Pa., where he is located with the Yocum Brothers Company, cigar manufacturers. It is worth printing as it has been a long time since anyone has heard from him.

"I salute such good nature as yours in taking the time to write to an old renegade like myself. The article was the result of a three months lay-off following an accident that damn near cost me my one and only left eye. However, it is again on duty. The article is a poor exhibit for such a lengthy vacation, but then I couldn't use the uninjured eye for the first two months, and again, only about two-thirds of the article was worth printing. But since the editorial page thought it worth while to comment on it, I might try it again sometime.

"For the past several years I've been doing my little bit in trying to keep one of the independent cigar manufacturing companies on the profitable side. About nine-tenths of the problem consists in sales promotion. So, if anyone knows how to get the ladies to switch from cigarettes to cigars, please let me know. — It has been so long since I've seen any of the crowd that I'd be afraid to attend a reunion without taking my Senior Portfolio with me. I'll get to one some time, but I don't even know where I'll be two weeks from today. Ed Schell's letter regarding the course in Administration is a mighty good move. Having no children of my own, it will take some digging around to get the information he asks for, but it's on my list for the near future. One little item causing much surprise is the number of well-educated executives, wishing to make, say, a gross profit of 25% on their business, merely add the 25% to their costs. Surely engineering and administration ought to make a knockout combination.

"Haven't noticed any improvement in business since the elections were disposed of this week, so am now waiting until after Armistice Day. Having just paid the bills for having the house painted, roofs gone over, draperies cleaned, and coal cellar filled, it looked to me as if I had undertaken the restoration of prosperity all by myself. — I believe that I can still offer a cheery glass to any of the crowd that drops in — at least to the first four or five."

The same issue of *Factory and Industrial Management* describes a new course at the Institute under the direction of Professor Edwin H. Schell, which will allow specialization in business control equipment and methods, and specialized management accounting analysis. — The Boston papers recently carried illustrations of the new 26-Apartment building that is being erected in Malden, with C. F. Springall, IV, as architect. Cy seems to have the call on buildings of any size going up north of Boston.

E. H. Schell, II, has very kindly given me the following description of the trip which he and his family enjoyed abroad early this summer. I am printing the whole letter as I know we will all find it interesting: "To sum it all up, we really had a much better time than we deserved. During the five weeks in May and June that we were in England, it rained but two days. In approaching Norway we were warned that Bergen might be more than damp, yet during our stay of nearly a week, there wasn't a cloud in the sky. In Scotland, the land of raincoats and Wellington boots, we encountered more 'scotch mist' than rain.

"Even the North Sea was propitious. Going to Norway we found the water placid although one of the passengers told us that it was the fourth calm crossing out of 19 in his experience. Returning, it was reported that we had a rough night, but as I was asleep, I cannot vouch for it. — The outstanding pleasure of our experience came from the many kindnesses of our friends. On board ship for Liverpool we found the captain unusually gracious and were later told that our coming had been heralded by one of his old friends, the father of a Course XV student. In England we found that friendly hands had reached across the ocean, extending many opportunities for greater insight into the life and ways of our English speaking cousins than would ordinarily have been the case. For a number of years I had planned to visit my past students who, at the close of the war, had come in considerable numbers to Technology from Norway. Coming as our visit did at the close of our journey, we looked forward with much anticipation to these reunions.

"As we left the train at Oslo after an exciting ride across the mountains above the snow line, we found Harold Bjerke, President of the Technology Club of Oslo on hand to greet us with his good right hand men, Finn Borchgrevink and Claus Thellefsen. They escorted us to our hotel upon the heights a thousand feet above the town, and then outlined a program of entertainment which made our stay in Oslo one not to be forgotten. A particularly enjoyable event was an afternoon sail on the Oslo fiord in a privately chartered yacht with the good company of the club members and their wives. Equally pleasant was a dinner party at the quaint Frognersaetern Restaurant where one may see for miles across the many islands that enclose the harbor.

"Some idea of the hospitality of these fine people is given when I tell you that President Bjerke gave three days of his busy life that I might go with him by motor to the great inland nitrate plants and see the amazing hydro-electric developments, over which his father was for many years the guiding genius. As we waved good-bye to our hosts in Norway, I think we all realized that perhaps the greatest richness of travel comes from new friendships found and old friendships renewed." — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. MCGRATH, *Assistant Secretary*, McGraw-Hill Publishing Co., Inc., 10th Avenue and 36th Street, New York City.

1913

News trickles in rather slowly to your Secretaries. No direct letters have been received for some time. As you well know, the Secretaries act as a clearing house of Class Notes. If none come in, none go out. So do your bit and help out.

Phil Barnes is with the Pfandler Company in Rochester, N. Y., as assistant general sales manager. Married, one daughter, and a golf bug complete the specifications. — The duPont Ammonia Corporation has C. L. Burdick as assistant chemical director. He is married, lives in Wilmington, Del., and belongs to more clubs than any member of the Class. — Railroad work has claimed A. C. Brown. He works for the Missouri, Kansas and Texas R. R., at Parsons, Kan. His job, aside from caring for five children, is chief land appraiser. Why not some real news of Kansas, Brown?

We see technical articles occasionally written by one Bellis and have learned that he is our own Arthur E. Bellis, now President of the Bellis Heat Treating Company of Branford, Conn. — Harry Burnham has taken to the financial game, being connected with Hale, Waters and Company in Boston. Mrs. Burnham and two children complete the family, residing in Wollaston, Mass. — Youngstown, Ohio architecture is far the better for having B. E. Brooke in town. He is in business for himself, and combines golf and horses for hobbies. He is married and has two children. — The Fisher Body Corporation at their Kansas City plant have Win S. Boynton as superintendent and engineer.

E. L. Bray is working for the National Metal Edge Box Company in Philadelphia. He lives in Upper Darby and works at golf during his spare time. — Here is the first news of Bill Horsch since leaving the Institute. He used to be in the research laboratory of Applied Chemistry. Continuing along the same lines he is now in the research department of the Vacuum Oil Company. Let us hope he is spending some of his time looking for a more pleasing company trademark. He lives in Woodbury, N. J., and admits being a home gardener. — Phil Terry and Archie Spaulding are running the Spaulding-

1913 Continued

Moss Company in Boston, blue printers extraordinary, draftsman equipment, and so on. Phil commutes from Scituate and is kept busy looking after three children.

From Corning, N. Y., comes news that John G. (Gus) Lanning is mechanical engineer at the Corning Glass Works. He still has the automobile tinkering bug which he had in student days. — The Government service has claimed many '13 men, among whom is Elliot H. Gage. The U. S. Public Health Service at Chicago claims him as a sanitary engineer. With Mrs. Gage and two young engineers he lives out on the north side of the machine gun belt. — An unusual job is that of William Wallis. He is with the Carnegie Institution in Washington, D. C. Specifically he is a magnetician in the Department of Terrestrial Magnetism. There cannot be very many similar jobs in the whole world. Perhaps Wallis will write and tell us all about it. He also admits being a gardener. — Washington also claims J. V. Walsh. Joe is with the Interstate Commerce Commission as an examiner, whatever that is. The '13 contingent in Washington is by no means the smallest. — GEORGE P. CAPEN, *Secretary*, 50 Beaumont Street, Canton, Mass. — ARTHUR L. TOWNSEND, *Assistant Secretary*, Room 3-435, M. I. T., Cambridge, Mass.

1914

On November 5, the series of winter luncheons in Boston were resumed. This initial luncheon started off with a good attendance and much enthusiasm. When it is considered that there is an ever-decreasing number of '14 men in Boston, because of the usual drifting away to other industrial centers after graduation, the attendance of 11 at this luncheon is something to be quite proud of. It is planned to hold these luncheons throughout the winter at 12:30 P.M. at the Engineers Club, 2 Commonwealth Avenue, on the first Wednesday of each month. Should you be planning a visit to Boston, try to make it at a time which will enable you to attend one of these luncheons. Those attending the initial meeting were: Atwood, Stanyan, Crowell, Horton, Fales, H. S. Wilkins, Crocker, MacKenzie, Trufant, Sherman, and Richmond.

A very pleasant announcement was received recently from Ollie Hall. It reads as follows: "A son was born to Mr. and Mrs. Oliver C. Hall of Radburn, N. J., on November 6. He will be named Oliver Ellsworth, for one of his forbears among the early residents of Connecticut." The '14 men in New York have undoubtedly already unofficially congratulated Hall in an appropriate manner. Official congratulations are hereby extended.

Phil Currier is back in the United States and at his old stand, with the General Electric Company at Schenectady. He has had quite a series of misfortunes, including water on the knee and losing his appendix. Phil, however, writes in his usual happy vein, and appears to be quite cheerful through it all. He further states that he would like to see any '14 man who happens to be in the vicinity of Schenectady. He writes in part as follows: "I saw Shepard in Buenos Aires, but left before Danforth arrived. We came over the Andes to Chile and up the West Coast. At about the highest point that we went there is a natural rock bridge and I got off the train to see it — slipped and cut my knee on a railroad track, so came home with a game leg — water on the knee. As long as it was water I got it by the customs all right! Well, that was the start of a run of hard luck for us. Since I have been back besides a couple of minor operations on my eyelid, I have been in the hospital three times for operations. Mrs. Currier was very seriously sick and was in the hospital for two operations, and even Philip, Jr., had an operation as he went to the hospital and had his tonsils out. Some luck!" — HAROLD B. RICHMOND, *Secretary*, 30 Swan Road, Winchester, Mass. GEORGE K. PERLEY, *Assistant Secretary*, 21 Vista Way, Port Washington, N. Y.

1915

New Year's greetings to all with my best wishes for a happy, successful, and prosperous 1931! What better way for us to open this new year than to have the following news from the long silent McCeney Werlich, X, written from the Embassy of the United States of America at Warsaw, Poland: "This letter should reach you on or about Thanksgiving Day and should help you pad the space in the '15 notes; therefore, give thanks, although I have been fairly remiss in writing to the Class Secretary, lo, these 15 years.

"After peddling locomotives and being a soldier intermittently from 1915 to 1925, I became one of those strange birds known as a Foreign Service Officer of the United States. In July of 1926 I went to Riga, Latvia, as Vice-Consul, accompanied by my wife and my French-born son (Paris, January 23, 1924). There I shivered and shook in the winter time, when not writing by the pound for the American Government; whereas, in the summer I swam in the icy Baltic. It was a lovely place, where we lived on partridges and venison, and stories about the Bolsheviks.

"In February of 1928 I received a hurry-up order to go to Warsaw as a Secretary of the Legation, and here I have been ever since. The most exciting part of my transfer was the motor trip from Riga to Warsaw — 425 miles, in February, with snow in proportion. I was shovelled out three times but made the trip in two days. Since becoming a diplomatic officer I have had my share of teas, but in accordance with the custom of the day I have worn white spats only twice and have not yet developed a bracelet. Our pastime in Poland is motoring and I have managed to put in over 10,000 miles annually in the country, with a trip to France every summer. So you see that life is really not too terrible. The only Technology man whom I have seen in ages is George Gibbs, a civil engineer, Class of '00. He is Canon in the Pro-Cathedral in Paris. There is no complaint about life, although I would like to see some of my friends from Boylston Street occasionally. The best of good wishes to you and all our mutual friends."

I am sure you will all join me in being pleased to hear from McCeney and wish him the best of success in his work. I should judge from his letter that he leads a colorful, romantic, and interesting life. Surely our classmates are widely scattered all over the world.

After the splendid responses we have had and the interesting columns in each of the issues thus far, don't let us fall down on this record. I am looking forward to letters from as many of you who will take the time to write something about yourselves or any of our other classmates. Let us make the February issue a big one! — AZEL W. MACK, *Secretary*, 379 Marlboro Street, Boston, Mass.

1916

Plans for our Fifteenth Reunion are progressing very rapidly. Steve Brophy has been elected general chairman of the Reunion Committee and has as his chief assistants Bill Farthing, Chuck Loomis, Hovey Freeman, Ralph Fletcher, and your humble servant. Time and place has already been tentatively decided upon and from the response which I have had from several of the class members, I know that we are going to have a record-breaking attendance. Knighty Owen is now taking golf lessons in preparation for the golf tournament. He stoutly maintains that he and Bobby Jones are going to retain their crowns. Louis Stevens has also told us that he is going to be among those present so there is no question but there will not be a dull moment.

I was pleased to receive the notification recently of the arrival of Howard Gifford Claussen. The birth took place on October 21. Congratulations! — Harold Russell has broadened out his activities as a boiler maker and with his brother has started a machine shop specializing on the design of special tools, jigs, and fixtures. The new shop is located in South Boston. — Ed Whiting is still located with the Westinghouse Electric and Manufacturing Company in their Boston Sales Department. Ed is specializing on the sale of fractional horse power motors. He now has four children and makes his home summer and winter in Swampscott. — Ernest Gagnon has recently been transferred to the Buenos Aires branch of the Goodyear Tire and Rubber Company. He must be having an interesting time in the midst of the present revolution.

Remember to start now and make your plans for the Reunion next June. — HENRY B. SHEPARD, *Secretary*, 269 Highland Street, West Newton, Mass. CHARLES W. LOOMIS, *Assistant Secretary*, 7338 Woodward Avenue, Detroit, Mich.

1917

George H. Stebbins, masquerading as Hobart Stebbins, General Manager of the Atlantic Works and the Simpson

1917 Continued

plant of Bethlehem Steel Corporation, East Boston, was photographed recently with Charlie Schwab and President Grace of his company. The photograph appeared in Boston newspapers. Judging from Mr. Schwab's comments to reporters at the time, Stebbins' and Schwab's companies as a whole are not feeling the unemployment situation as seriously as are some others. The Atlantic Works were formerly controlled by Paul Bertelsen, prior to their purchase by Bethlehem.

Mrs. Curtis Clapp of West Roxbury announces the engagement of her daughter, Miss Elizabeth Clapp, to Charles Lyman Coburn of Lexington and Cambridge. Miss Clapp was graduated from Simmons College in 1925. — S. S. Batchelder has formally severed his connection with the Barre Wool Combing Company and is now a member of the firm of Dobson and Batchelder, making woolen blankets at Needham, Mass. We have been told that he specializes in baby blankets and if so, believe that one A. P. Dunham may be able to obtain quantity discounts. — RAYMOND S. STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

1918

In the boldly commanding upper left hand corner of the staid old Boston *Transcript's* page of November 22, devoted to the Fourth Annual Small-House Exhibit of the House Beautiful magazine, stands Bill Wills' masterpiece built for George S. Burgess at Wellesley Hills. It's the sort of house one dreams about: trees and fireplaces and snug, cosy little rooms up under the eaves.

Through Lieutenant Wells, located at the U. S. Naval Base in Haiti, comes news of his brother, Franklin Wells, who has been engineer of tests for the Westinghouse Air Brake Company but who now goes to 1048 Goodland Ave., South Bend, Ind., to do research for the Bendix Aviation outfit. The Lieutenant says that with can opener, crow bar, or subpœna he has been unable to pry a letter out of brother Franklin in five years, so we saved our two cents.

Frederick B. Philbrick comes through in grand style from 400 Westmoreland Avenue, San Mateo, to say: "I arrived in July, and the first outstanding contrast from New England was the extreme dryness and lack of green grass and trees. My impression of California had been that of a semi-tropical land with a thick growth of foliage. Imagine my surprise and real disappointment to see only brown bare hills with here and there a small tree, its leaves dusty and almost as brown as the grass. The reason, of course, is the lack of rain during the spring, summer, and fall. Rain appears to be the most precious commodity. Oil has often been referred to as 'black gold.' I think that here water better deserves the title of 'white gold.' The rainfall, when it starts in November or December, is carefully watched and measured to the hundreth of an inch. It is the basis of prosperity in all agricultural pursuits. Without storage reservoirs and irrigation, most agriculture would be impossible west of the Sierra Nevadas. I have heard several theories as to why there is no rain during three-fourths of the year; but whatever the reason, it is an established fact. In Oregon and Washington some rain falls all the year round, although mostly in the so-called winter months.

"Very few straw hats are worn in San Francisco during the summer and most of those seen are worn by visitors. Felt hats the year round are the rule; but never any ear muffs or fur gloves. The street cars all have two compartments, one open and one closed, and both are used in all seasons. The men wear top coats and the ladies fur coats in July just as much as in January, as the cool breeze and fog come in from the ocean during all the summer months. Steam heat is supplied every month in the year in the apartments and offices, whereas a few miles inland all the latest hotels are equipped with air cooling systems for the summer. — There are many other interesting comparisons between life here and in New England. Food is cheaper and all kinds of vegetables and fruits are available at reasonable prices at all seasons. Automobiles travel much faster on the highways. I have often averaged 45 miles per hour for long distances. Some of these things can perhaps be discussed in a later letter. — Now tell me something about doings at the Institute. What is the latest subdivision of the atom and so forth? Remember Emerson's doctrine of compensation applies to letter writing as well as altruism." In which he is, of course, correct.

Mr. and Mrs. Nathan Pelonsky announced the marriage of their daughter Selma to Max (Bromo) Seltzer on the 19th of November at Brookline, Mass. Hearts and flowers. — F. ALEXANDER MAGOUN, *Secretary*, Room 5-328, M. I. T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, 51 Houston Avenue, Milton, Mass.

1920

I announce with pleasure the marriage of Lawrence E. Frost to Miss Doris P. De Louria at Wilmington, Mass., early in October. Frost is associated with the Electrical Research Department at the Institute and will make his home in Malden. — Stan Bragdon is now located at Milwaukee and can be reached by inquiring classmates at 1320 South First Street. Arthur Hartsook is now Professor Hartsook of the Rice Institute at Houston. He is in the Department of Chemical Engineering. — George Morgan has moved from Port Arthur, Texas, to Lake Charles, La., and is with the Gulf States Utilities Company. — Ray Ridgway has crossed the border and is now at Chippewa, Ontario, instead of Niagara Falls. There appears to be a trend toward the southwest. — George Wamsley is now in Baytown, Texas, having left Philadelphia.

These notes are written considerably in advance of Christmas so your Secretary is hoping the Christmas spirit will act to revive a little class spirit and result in more copious notes. Your Secretary used to be occasionally heartened by the drifting in of news either direct or by mail, but since the Reunion of last spring he has been practically ostracized. He has racked his brain but is unable to think why he should receive such a cold shoulder. — HAROLD BUGBEE, *Secretary*, 9 Chandler Road, West Medford, Mass.

1922

We missed the December issue of The Review, for at the time that the Class Notes were due, there was much excitement in the Rundlett home. Lucy Anne was born on October 17, and we are glad to report that she is gaining rapidly. — Have you all heard of Patsy Ann, daughter of Harry and Mrs. Rockefeller born in July? Harry told me at lunch yesterday that she weighs 15 pounds. Possibly as months go by we will be able to give some competition. — From Al Browning we have received a card telling of the arrival of Nancy Elea, born on October 11. — A letter from Al Sargent received just as we are going to press tells of the arrival of a daughter, Marilyn Ruth. Congratulations, Al. Al is associated with the Phillip Carey Company in Boston and is living at 94 Lincoln Street in Melrose. Vassar's daisy chain should have many candidates a few years hence.

Since the letters received from Hugh Shirey, Tommy Thomson, and Ham Williams last spring, we have had no correspondence. Lacking Eric's technique, I depend upon you for information to pass along, so if you have news, let us have it.

The Alumni office has sent us clippings which read as follows: The engagement of Ralph M. Smith, son of Mr. and Mrs. J. Albert Smith and Miss Mildred Newbauer, daughter of Mr. and Mrs. John Neubauer has been announced. — Mr. and Mrs. Max Greenebaum have announced the engagement of their daughter, Miss Rosalyn Keller Greenebaum, to Nathan Hessberg Pohly. Miss Greenebaum was graduated from Smith College in June. No date has been announced for the wedding. — Miss Anna Leigh Kendall of 163 Brattle Street, Cambridge, daughter of Mr. and Mrs. Eugene Worthington Kendall, was married July 2 at 12:30 o'clock in the Church of St. John the Baptist in Sanbornville, N. H., to James Truslow of Whitinsville, Mass. Mr. and Mrs. Truslow went abroad on their wedding trip, and have been at home in Whitinsville since October 1. Miss Kendall was graduated from the Boston School of Occupational Therapy. — Miss Elizabeth J. Hemeon, daughter of Dr. and Mrs. Frederick C. Hemeon of 9 Standish Street, Dorchester, was married on October 15 to Godfrey deBurras Speir of New York, son of Mrs. Oswald Speir of California, at the Second Congregational Church, Dorchester. The ceremony was performed by the Rev. Vaughan Dabney, D.D. The couple are living at 92 Burr Avenue, Hempstead, Long Island.

1922 Continued

It is hard to say what lies ahead in business for 1931. We hope it will be a good year for all. Heinie Horn phoned yesterday and joins in wishing you happy holidays and much success in the New Year. — RAYMOND C. RUNDLETT, *Secretary*, The Curtis Publishing Company, Lincoln Building, 42nd Street, New York, N. Y.

1923

My recent plea for an Assistant Secretary has been answered in a surprisingly satisfactory fashion. Doc Smith, Bob Hendrie and I met at lunch one day a month or so ago and concluded that it would be desirable to have an Assistant Secretary from New York City, because of the large and active group of 1923 men there. — The very next day I had a line from Pete Pennypacker reporting that the New York group, at a recent dinner, had decided it would be desirable to have a New York Secretary to report local affairs of 1923 and had elected him to be it. Talk about something falling from the laps of the gods! I can't think of anyone in the New York gang who can do a better job than Pete. He makes his bow in these notes, having sent in the following very informative letter which I am here reproducing in full. The excellent example he sets of giving a brief biographical sketch is one which I commend to others.

"Before taking up my new duties as Assistant Secretary of the Class, it might be in order to say a few things about myself; for I have been as lax as most of our classmates in sending in notes for The Review. It seems hardly possible that seven years have passed since we were graduated. They have been seven very short years for me, but I realize that they have been long enough to scatter our classmates into all directions and over many widely diversified fields.

"It has been my good fortune to remain in shipbuilding. As you may know, I was interested in this field before I entered Technology, having already had yard experience, and also during the three summers while going through. Upon graduation, I entered the Scientific Room at Cramps Shipbuilding Company in Philadelphia, and was there four years when they collapsed. Fortunately, I then connected with the Marine Engineering Corporation in Philadelphia and was there a year, also in scientific work relative to the design of scout cruisers. From there I was sent to Washington to represent the National Council of American Shipbuilders on the technical staff investigating safety of life at sea, in anticipation of the international conference held in London last year. I am now in the central office of the National Council of Shipbuilders in New York, and indications are that I shall be anchored here for some time. I have gone far enough now to feel that I shall be a shipbuilder all my life.

"Last year I was married at my wife's wedding! (I put it that way because I had nothing to say about it, as you will appreciate if you are married yourself.) Doris (that's her name) and I have bought a little home in Cranford, N. J., where we shall always be glad to welcome any of the '23 fellows who happen along. That, very briefly, is my story thus far, not at all startling or unusual, but just a natural succession of events as the years roll away, although as each year passes my attachment to Technology grows stronger, for I learn to see a little clearer the value of that training and of the happy associations there when hearts were young and free. — You requested a report of our New York Club dinner.

"I think it is important that our classmates at large should understand what the New York Club of 1923 is. This club was organized three years ago by the '23 men in the vicinity of New York, with the purpose of holding and strengthening the ties of former days. Any member of '23 (who was enrolled for one term at the Institute) is automatically a member of this club whenever he is in the vicinity of New York. There are four events of a social nature each year which pay for themselves. Hence there are no dues charged for membership. I hope that henceforth whenever a classmate comes to New York he will send me word so that I may inform him of the next meeting of the New York Club of '23.

"Our annual business meeting took place on October 29, 1930. There were 17 fellows present, as follows: George E. Barnes, James E. Brackett, John A. Frank, Rodney M. Goetchius, Robert H. Henderson, David Kaufman, Charles M. Mapes, Walter S. Marder, Jr., Edmund S. Pomykala, Albert J. Pyle, Charles Shilowitz, Francis P. Squibb, Robert S. Stuart, Alex Taller, Lyman L. Tremaine, Walter W. Zapolski and myself. The following officers were elected for 1930–1931: President, James E. Brackett; Vice-President, Charles M. Mapes; Secretary, Walter S. Marder, Jr.; Treasurer, John A. Frank. The business meeting followed a dinner at which many old memories and friendships were revived. Lyman L. Tremaine gave an account of the All-Technology Reunion in Boston last June. Albert J. Pyle reported the picnic of the club held last September. James Brackett reviewed the dance held in the McAlpin Hotel jointly by the classes of '23, '24, and '25 last January. After the dinner and business meeting, Professor A. A. Merrill, who was largely responsible for the founding of the aviation course at M. I. T. (1912–1914), spoke on 'Curious Ideas in Physics,' which proved to be an analysis of the Einstein theory without the aid of mathematics.

"I have been in touch with many other fellows located in this vicinity and shall try to have some of their personal news in shape for the next Review. With all good wishes."

It will probably be necessary for us to depend for a number of items each month on the Institute's Clipping Service. The Chattanooga *News* reported in August the then coming wedding of Alva James Hartwright and Miss Rosa Mae Moore of that city. The news story says that since the announcement of their engagement the young lady has been one of the local season's most fêted brides-elect, so it looks as if Al was in luck. A wedding trip by motor was scheduled which included Washington, D. C., and a visit to Noroton Heights, Conn., the groom's home town. Al has been with the Tennessee Electric Power Company as Superintendent of underground construction.

Among address changes reported this month was that of Cornelius E. Harrington to a new address in San Francisco, 116 Frederick Street. A clipping from the social page of the San Francisco *News* apparently explains this. It reports his wedding on August 9 with Miss Eleanor O'Neil. Presumably the couple are domiciled at the new address. The bride is a graduate of the Dominican College at San Rafael. — Al Pyle, VI, one of the few course secretaries we have heard from in several moons, writes in wishing me good luck in the Class Secretary's job (which kind thought is appreciated) and sends in an item he says he's been hanging on to for several months in the hope of having something to add to it. This reports that George W. Bricker, Jr., was married last summer to Miss Elizabeth Jack, daughter of Dr. and Mrs. Lewis Harlow Jack of West Newton, Mass., and that the couple are making their home at 18 Day Street, West Newton.

To these venturesome souls, all congratulations. Another to whom congratulations are in order is Hugh Spencer, whose office with the New England Power organization is in the same building at 89 Broad Street, Boston, where Doc Smith and I are also located, so that we bump into Hugh occasionally. He is celebrating the very recent arrival of a new member to his family. This makes a boy and a girl for Hugh.

Congratulations on a different sort of accomplishment are due to Dr. Per K. Frölich, who has been since 1929 research chemist for Standard Oil Company of New Jersey. *Time* Magazine hails his presentation early in November with the Grasselli Medal of the Society of the Chemical Industry as recognition of the new field in chemistry known as *high pressure synthesis*. I am quoting from the *Time* article as it gives a bit of background so that you can gauge the significance of Dr. Frölich's work:

"The use of high pressure in industrial chemistry was begun many years before the war by Dr. Fritz Haber, a professor at the Polytechnic School in Karlsruhe, Germany. He worked in his small laboratory for years with nitrogen and hydrogen trying to make them into ammonia (NH_3). He realized that the more closely he brought his nitrogen and hydrogen molecules together, the more chance there would be for them to unite. He used high temperatures to increase the velocity of his molecules and a catalyst to aid the reaction. He obtained ammonia, but it obstinately persisted in turning itself back again into nitrogen and hydrogen — a chemical equilibrium.

"Then Henri Le Chatelier, French chemist, announced: 'When an external force is exerted upon chemicals in equi-

1923 Continued

librium, the chemicals will adjust themselves to counteract the external force.' Dr. Haber pondered that idea, applied it to his ammonia process. Hydrogen and nitrogen, he knew, shrink to half their volume when combined to form ammonia. He found that the application of pressure made that shrinkage permanent, made the hydrogen and nitrogen stay put. Synthetic ammonia processes today use pressures varying from 200 to 1,000 atmospheres. . . .

"Since Haber, scientists have successfully produced many a product besides ammonia by the pressure-plus-catalyst method. Grasselli Medalist Frölich's fame derives from his development of satisfactory catalysts for new processes and products. He found that metallic oxides are good catalysts in the synthesis of higher alcohols from water gas. Says Dr. Frölich: 'There is no chemical reason why dyestuffs should not be produced out of the abundant supply of natural water gas . . . and a synthetic material much closer to silk than rayon.'"

I am indebted to C. E. Locke's office for the two following items. The first reads: "E. R. Richards is now with the Monterey Steel Company at Monterey, Nueva Leon, Mexico. He recently married Miss Pura Gonzales." The second is an extract from a letter from A. F. Johnson '26. "There is a Tech man by the name of M. L. Carey '23, III, who is likely to take charge at the reduction end at Arvida plant of U. S. Aluminum Company in Quebec, where he has been since 1926, as a recent promotion moves his immediate superior to the ore plant at Arvida, and moves the Arvida plant superintendent to Pittsburgh."

I am, by training, I suppose, averse to report so many items in such meagre detail, but if I waited for full particulars, these columns would be just so much white paper. I shall mention each month address changes which indicate some movement of importance to those involved. I would appreciate hearing from those mentioned in these items that we may be posted on what's doing and who's doing it: Ed Bancroft from Edge Moor, Del., to Saranac Lake, N. Y.; George Nesbitt, Jr., from Burlingame to Menlo Park, Calif.; Milton E. Parker from Norfolk, Va., to Baltimore; Art Stuckey from Saskatoon, Saskatchewan, to St. Louis; John F. Wendt from Providence, R. I., to Hamden, Conn.; Bill Allis from Princeton, N. J., to Munich, Germany; Clark Barrett from Youngstown, Ohio, to Chicago; Charles Cristal from Philadelphia to Buffalo; Lt. Horatio C. Sexton from New Albany, Ind., to Portsmouth, N. H., Navy Yard; Dr. Robert S. Taylor from New York City to Evansville, Ind.; and Dr. Dorothy W. Weeks from Cambridge to Wilson College, Chambersburg, Pa.

A clipping from the Winchester (Mass.) *Star* is received in time to be mentioned in this issue. It tells of an informal reception to intimate friends and relatives given by Professor and Mrs. William J. Drisko occasioned by the recent marriage of their son, Benjamin Buckman Drisko, to Miss Rose Thompson of Addison, Maine. Miss Thompson is a 1926 graduate of Bates College and received her M.A. from Columbia in 1928. The couple plan to spend the winter at the Drisko farm at Addison, Maine.

As these notes will appear in the usual course of things during the holiday season, here's wishing all the Class of '23 a Happy New Year. — HORATIO L. BOND, *Secretary*, 31 Concord Avenue, Cambridge, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, Room 661, 11 Broadway, New York City.

1924

The classes of '23, '24, and '25 are going to give their annual dinner dance again on Saturday, February 14, at the Hotel Commodore. This is a party that was started last year by the three classes in New York City and was so successful that it is being undertaken again this year by popular demand. Bill Correale tells me that since last year they have been actually getting requests for a repeat performance. Invitation to attend the party is extended to all Technology men, whether in the three classes or not, and residence in New York City is not a requirement. The only request made is that those who plan to go will let Bill Correale know. Address him at 142 Maiden Lane, New York City.

Bill is busy now on work for the St. Lawrence Power Development Commission, State of New York. He is, in case it has slipped your memory, with Parsons, Clapp, Brinkeroff, and Douglass. — The Class regularly has luncheon in New York at the Planters Restaurant on Pine Street, but it is reported that numerous weddings are showing their effect upon the attendance.

Weddings have been quite frequent so that I have quite a number to report. On August 30 Don Kennedy was married to Miss Clementine Rodger of Lawrence, Mass. The wedding trip took them to Havana and the Panama Canal, and from there to Angangueo, Mexico, where Don is doing mining engineering work. — On September 5 another Don was married. Don Murdoch was married to Miss Isobel Engle Dann of Sault Ste. Marie, Mich. They will make their home in Cambridge, where Don is now located. — On Saturday, September 20, in Winston-Salem, N. C., Roland Black and Miss Mary Elizabeth Sheets were married. Roland is with the New York Telephone Company and is now living at 176 Leverich Street, Hempstead, L. I. — In Salem, Mass., on October 6, Miss Mary Murray and Roger L. Griffin were married. After a honeymoon to Washington, they returned to Peabody where Roger is living now on Perkins Street and where he works in the technical research department of the A. C. Lawrence Leather Company.

Miss Helen Morgan Voorhees became the wife of Ed Plant on October 7, the wedding being performed at St. Bartholomew's Church in Jersey City. — And in Sequin, Texas, Paul Sharkey was married to Miss Madeline Goetz. Paul is with the Fargo Engineering Company, constructing dams for hydraulic purposes in the southwest. They will live in Gonzales, Texas. — And the latest I have notice of is one on November 4, when Jack Stanton and Miss Grace Elizabeth Dailey of Arlington were married. The last I heard of Jack, he was here in Hartford with E. L. Ensworth and Son. — A card was recently received announcing the arrival of Susan Douglass to Mr. and Mrs. S. Howell Brown on October 2. To all the weddings and arrivals we wish to extend our congratulations and best wishes.

I have a letter from Paul Cardinal from which I should like to quote in part: "On Sunday night, October 26, there was born unto the wife of one Jose Loubriel a baby boy, to bring up to 1.000 the batting average of the Technology fellows included in the personnel of Hoffmann-LaRoche, Inc. For Jose is a '24 man, now functioning as analytical chemist for us, who only a little over a year ago imported an erstwhile sweetheart from his home town in Porto Rico for the purpose of marrying her. Being a modest sort of fellow, you probably wouldn't have heard from him — although every one in the firm who smokes had his choice between cigars (and real ones from Porto Rico) and cigarettes at Jose's expense. Unofficial reports have it that the newcomer to the Loubriel family is to be named Norris after the noted prof. of the same name at Technology! Incidentally, Jose has been dubbed 'Honest Joe' by our executives, the result of innumerable wagers he is willing to make on anything from football games to the weather, on which he inevitably comes out on the right side, even though he has given his taker his choice to begin with.

"I have been operated on since I last wrote you. On September 15, I was inveigled into deliberately inhaling the fumes from an ether cone at Paterson General Hospital, so much so that an anæsthetic sleep was produced, from which I did not awake until my good friend the surgeon had pocketed my appendix. It was a fine chance to test some more of our noted drugs — and believe me they work. The convalescence was rapid and I am now in first rate shape again." — H. G. DONOVAN, *General Secretary*, 372 West Preston Street, Hartford, Conn.

COURSE X

The following letter from Warren E. Hill was received just too late to be in the last issue of The Review. Here it is: "Last March I accepted a research and development position with the Prophylactic Brush Company of Florence, Mass. We are living at 22 Prospect Street, Northampton and we like Northampton very much. This will be our first winter here and we look forward to it with a great deal of pleasure with the many concerts, lectures and other attractions held here in connection with the college. From the manufacture of lime to that of tooth brushes is rather a broad jump but I am

1924 Continued

enjoying my new work. Our youngster is 2¼ years and well. Hope your little family is coming along nicely."

Pat Schreiber is at some rubber recovery plant in Naugatuck, Conn. — Art Straight is with Henry L. Doherty Company of 60 Wall Street, New York. — Nearly everyone seems to be laying low as far as correspondence is concerned. At least they are sure the evidence will not be held against them. — Jack McCoy's daughter Margaret Joan is rapidly growing up. Jack is certainly fond of her. He is with the Tidewater Oil Company at Bayonne, N. J. — Write now to: WILLIAM B. COLEMAN, *Secretary*, 112 Seeley Avenue, Arlington, N. J.

1926

After several months of pernicious anemia, Der Konvergenzpunkt, the robot that lives on Class Notes, shows signs of improvement. His malady had become so acute that extreme measures were necessary: polyglandular therapy, liver, and tickling on the feet were all used, but these measures accomplished little because it was simply a matter of starvation.

By yielding a batch of wedding and engagement notices the Institute Clipping Service is mainly responsible for breaking the famine. Note the new names on the marriage list:

No. 127 Leonard Volk Phelps to Miss Helen Seye Van Trease of Birmingham, Ala., in August. They will make their home in Bluefield, W. Va., where he is engaged as bacteriologist for the Board of Health.

No. 128 William Robert Franklin to Miss Cordelia Jane Maupin of Oklahoma City on September 5. He is connected with the Velton Construction Company of Brownsville, Texas, where the couple are to establish their home.

No. 129 Arthur E. Keay to Miss Dorothy Blockmer of Plymouth, on September 27. They are to live in West Bridgewater. Mr. Keay is employed at the Brockton Gas Light Company.

No. 130 Russell Carlson to Miss Florence Marion Gage of Seattle, Wash., on August 9.

No. 131 Raymond Mancha, Jr., to Miss Isabel Bibb on December 3.

No. 132 Leonard L. F. Remington to Miss Elizabeth Mary O'Connor in Boston on July 14.

No. 133 John Kauffman Price to Miss Alice Gordon Cooper in early November at Water Valley, Miss.

To the engagement list may be added one name: Arthur T. Hewlett, 2d, to Miss Natalie Caroline Franz of Stockbridge, Mass.

Obviously, the old Greek God Hymen is interesting himself in the members of the Class of '26.

Professor Charles E. Locke has passed along to your Secretary excerpts from a letter received from A. F. Johnson. "I have seen very little of my classmates since graduation. Hird and Doten were here for a day about a year ago. They were on their way to Boston at the time, having been out West. Both had had a number of jobs in the West. Both were broke temporarily. Neither were married. They seemed pleased with their taste of a mining engineer's life, however, and were three years' richer in experience, though they scarcely looked three years older. Richard Davy '27 who was with Doten in Geology was here in town working for the Certain-Teed for almost a year. He was transferred here from one of their other plants last spring. He left the Certain-Teed and went down to New York, and I have since recently heard that he is married.

"So far as experience goes I have enjoyed quite an assorted line here at the Aluminum Company of America at Niagara Falls. Niagara Plant prides itself in having a labor organization second to none of its kind. Doing my share in developing bonus systems, improving working conditions, and in general seeing that the men get a square deal, and realize that they do, has been the best experience I could wish to find.

"Dick Plummer, also a classmate of mine, was with the U. S. Aluminum Company in Buffalo for about a year, but was interested in fabrication rather than reduction as I am. I was sorry to learn he had left the company after being transferred to Massena, N. Y., plant.

"You might be interested to know that the Aluminum industry has, of course, felt the depression like all industries, but that we are not yet curtailing our reduction operations at all at the Niagara plant. The chief reason for this is a happy coincidence by which a drought in the south caused such a tremendous water shortage there that five-sixths of one plant there was necessarily shut down for lack of power.

"We have a Technology dinner here about twice a year, always making a good showing in numbers at these, and everyone, of course, has a good time. Amusement after dinner may be bowling in the winter or golf in the summer, when a picnic dinner is more in style, with wives in attendance. Sorry to say I am not yet married."

In the next issue of these notes the Secretary expects to have some definite information about the Five-Year Reunion, which is scheduled for next June. Each member of the Class will also receive some direct mail advertising to which it is hoped he will make an immediate response, not only toward the Reunion but toward the conduct of this column.

The Secretary finds that the business of collecting Class Notes is not nearly so easy as a recent friend of his found the gentle art of getting married to be. This friend, having made the noble experiment three times, had on three sides of his bedroom pictures of his three departed spouses, on the fourth side of the bedroom there hung one of the old sampler mottoes that used to adorn the homes of our ancestors and the wording of that motto, was this: "The Lord Will Provide." Let us hope he will. New Year greetings are hereby proffered to all suffering readers. —J. RHYNE KILLIAN, JR., *General Secretary*, Room 11–203, M. I. T., Cambridge, Mass.

COURSE VI

I'se regusted! Getting information, news, or otherwise out of the Course VI men in '26 is harder than extracting eye teeth from hens, in my opinion. Perhaps they all have turned bootleggers during the depression and are afraid to reveal their whereabouts and their activities, or else they have made out so poorly in their own estimations that they are ashamed to report them. Yours truly has found out that he hasn't the world by the tail, but that the world has him by the throat, and admits it; so swallow your pride or put it on the piano (if you are so fortunate as to own one) and let's hear from you.

Some time ago I received an announcement of the engagement of Earl C. McMahon to Miss Miriam Ethelyn Thompson, but no details have been forthcoming. Open up, Mac, and let's hear the rest of it. Are you married or when is it to be? Congratulations! — I had to run for the smelling salts the other day. Reason — *letter* from one of my classmates, Charlie Kirsch. Your leather medal has been already designed, Charlie, and the specifications are out for bids. If you don't receive it subsequently, write me another letter. He seems to be happy and uneffected by the depression and his occupation seems to be on a high moral plane. In part he says (omitting profanity) "I'm still with the Tel Company and Dot and I are living out here in Richmond Hill now which is better than where we were and much nearer to the office. Oh, yes! did you hear that I helped win the war this summer? I was down at Fort Monmouth for the two weeks' training course and had a fine time. There was a good bunch of fellows down there and the course was interesting. We instructed the C.M.T.C. in the morning and then had our own instructions in riding, shooting, and lectures in the afternoon. I managed to make my marksman this time and also rode old C.D. — remember him? I'm up for my 1st (lieutenant) now so if I get the opportunity I think I will go again next year. While I was on my regular vacation I ran into Leo Teplow in a little town up in New Hampshire. Leo said he sees Ralph Hammar once in a while in Washington." — Thanks again, Charlie, keep up the good work. — RONALD J. MARTIN, *Secretary*, Jackson and Moreland, 31 St. James Avenue, Boston, Mass.

COURSE VI-A

Well, a long lost soul has turned up at last in the form of Johnny Sanborn, so let's hear what he has to say: "I have just been looking over the July number of The Review and was more than pleased to find some news of the old VI-A gang. Since you claim that 63.16% of the bunch have reported their whereabouts, I'm going to get a word in too, and tell you a bit about my doings in the three years since the fatal day when by the grace of God we escaped from the walls of learning and the vapors of the Charles.

"I can't claim to have helped as many companies along the highway to prosperity as friend Lissner, but at least I

1926 Continued

have managed to get into almost as many out-of-the-way places. As you remember I was one of the bunch of young hopefuls that fell into the clutches of Bowen of the I. T. and T. Well, for better or for worse I am still with them. In 1927 they started us all off together on a little training course down in the beautiful Isle of Cuba. They send you down there so that you can get hardened to the night life that goes with foreign service — then if it is too much for your constitution, they can get you home again fairly cheap. Well, I was down there about four months getting used to the Spanish tongue and to the things people lap up with it (if you get what I mean), when suddenly one afternoon the big boss sent for me. Not without some misgivings I eased into his office, only to find that he was worrying about sending a man to South America, via New York. Not being at all daunted, the next morning at ten o'clock found me on the boat for New York with a slight headache, but otherwise quite O. K.

"However, fate was against my going on to South America — plans were changed again and I was put into the transmission engineering office at New York headquarters. So from the fall of 1927 until the fall of 1928 I was up in New York living the peaceful life — in New York five days a week and generally up around Boston the other two. It looked as if this might go on forever when one day I heard that there were plans afoot to build a radio-telephone station down in Buenos Aires — yes, the very same one that now works with the U. S. and Spain. Well, I didn't know anything about radio, but I did have the urge to travel, so next thing I was off to the Argentine. And I've been down in these parts ever since.

"When we arrived in Baires, they were just getting ready to start on the radio links to Spain and the U. S. In the U. S. we were to connect with the A. T. and T. of course, and the Bell labs wanted to get a lot of dope on short wave transmission to the South, so one of our first jobs was to set up a test receiving station near Buenos Aires and spend one day — yes, the whole 24 hours — a week listening to and measuring test transmissions from the A. T. and T. transmitting station at Deal Beach over there in Jersey. There were only two of us that knew anything about the receiving apparatus, so for the first couple of months we had a lot of fun dividing up the 24 hours. For the first schedule we managed to get a pole up for the antenna, but didn't have time to finish our shack. So we set the receiver out beside the pole in a cow pasture and one of us took readings while the other swatted mosquitoes for him.

"However, after a while we got some operators worked in on this stuff, and we got over on to the construction of the main transmitting and receiving stations. I spent most of my time on the receiving station. And talk about the variety of things a so-called engineer may have to take a hand at! One day I would be trying to figure out how much of a gale it would take to blow over our water tower, the next day working out a fool-proof scheme for keeping the incoming 13,000 volts from getting mixed up with the 220-volt standby generator, the next day out with a transit helping lay out antennas or cable trenches, and so on. For three months we worked night and day, Sundays, and holidays and what have you, until the station for the channel to Madrid was finally finished and ready for test. And by the time this was done, work was actively under way on the receiving installation for the New York channel. Quite a bunch of fellows from the Bell labs were sent down to work on this installation, and a fine time was had by all. This channel — Buenos Aires to New York — went into service about four or five months ago, but in the meantime orders had come along to get work started on similar radio stations in Chile. This was about last September. They were all working like the devil on the stations in Buenos Aires, and at first didn't know who to send over here. But they finally picked the most useless member of the gang, and here I am.

"Well, for the first few months here I had things pretty much to myself. The big boss from Buenos Aires came over with me, but only stayed long enough to get me settled down in an office and then beat it back to Buenos Aires again. And I was left to get the preliminary work going. That sounds easy, but there really is quite a lot to it. In the first place you have to find tracts of land that are suitable for the transmitting and receiving stations. Then when you have picked out a couple of good ones, you have to find out if they are for sale, and how much, and then last but not least, you have to get the approval of the New York office. By the time you finally get a place bought you will have spent about three months and will have become well acquainted with the countryside for at least a hundred miles around — which is just what I did. Meanwhile we had to get out plans of the stations for presentation to the government here, make arrangements for power supply to the two station sites, study layouts for the buildings and antennas, and in general get ready to start the construction work. We got this all pretty well cleared up by the first of April, and since then have been pushing ahead on the construction work at both stations. Here as in Buenos Aires I have been out at the receiving station, and have had a great time organizing the job and trying to keep it going — especially since not one of the gang from the ditch-diggers to my chief assistant knows any English. At any rate, things are coming along well enough. We have our buildings more than half done, antennas ready to go up in a few days, and in general plenty going on, with every hope of being ready for commercial service from Chile to Europe by the first of next year.

"This note is already getting plenty long, so I'll leave off here and save the description of the beauties of the Andes till the next one (three years from now?). By the way, as you may know, Ike Gleason is located with the Chile Telephone — an I. T. and T. company down here. I was staying at his home for several months, but now he and the wife are on the way up to Boston for the hard earned three-year vacation." — BENJAMIN P. RICHARDSON, *Secretary*, 29 South Seccond Avenue, Mount Vernon, N. Y.

COURSE XV

George Warren Smith of 2 Elmwood Avenue, Winchester, Mass., compiled the following material about Course XV men. We are much indebted to him for assembling it. "Willard E. Vaughan left Dewey and Almy Chemical Company of Canada, Ltd., last summer and is now with the Standard Oil Company of New Jersey at Baton Rouge, La., in the Research Department. — Bob Richardson is in the sales department of the E. Stanley Wires Company of Boston selling waterproofing for buildings. He is living in Needham and is a proud father. — I saw Dan Bloomberg while he was home from Europe this fall. He surprised us all by bringing back an English bride. He has returned to Europe to make his headquarters in Paris as Technical Representative for the R. C. A. Photophone Corporation.

"I met Henry Rickard a few months ago out in Haverhill. He was rushing around trying to get the Rickard Shoe Company into production. He took me through the new plant where they were getting lined up to make high-grade women's shoes. — I call at the Samson Electric Company in Watertown from time to time and there I learned that George Booth is now with them in the Chicago office. George Breck is in this same company at Watertown. — Art Brockelman is a big butter and egg man in the true sense of the word. He is head of a large chain of markets in central Massachusetts among which is the second largest market in the world located at Worcester. He is more husky than ever and as yet unmarried, but not without prospects.

"I see Bill Cook now and then. He is President of the Wooleather Company, Salem, Mass., makers of sheepskin-lined slippers. Bill has charge of sales. His home is in Beverly and he, too, is a proud father. — I have dinner with Don Cunningham occasionally. He is still with the Hersey Manufacturing Company in South Boston, manufacturers of water-meters, and Don is showing them better factory methods. — This fall I stopped to see George Edmonds at the Atlas Tack Corporation in Fairhaven, and I understand that he was about to depart for South America. He was representing the Bond Company of Wilmington.

"Bob Glidden is still with the Ratheon Company at Newton, Mass., and so is Francis Anderson. — George Killam is with the supply department of the Boston Edison Company at their plant on Massachusetts Avenue. — Pete Doelger says that he saw Sid Miller out in Cincinnati a while ago and that Sid is working hard running a large glass bottle factory. — I was married in June to Ruth South-

1926 Continued

worth, sister of Win Southworth. Win is still with the Metropolitan District Water Commission as assistant engineer at the field office in Holden."

I have been out of town quite a bit recently visiting the Sears, Roebuck and Company retail stores. While on my trip I ran into Jiggs Rogers who is with the Wheeler-Wilcox Company in New York. I likewise saw Robert W. Schildknecht, '30, in Cincinnati, and Ed Hucknan in Dallas. The latter is with the Foxboro Co. — THORNTON W. OWEN, *Secretary*, 213 So. Wesley Avenue, Oak Park, Ill.

1928

We have been informed that 617 West Seventh Street, Los Angeles, Calif., is the new business address of Heney Dean. That is the address of the Union Oil Company of California. We prophecy great success for Heney in this new job because this erstwhile '28 politician always did have a pleasantly smooth line of the old oil to throw on the troubled waters. — The Class extends its hearty congratulations to Hue Thomas on the happy event of his marriage to Miss Alma Sanders. The ceremony took place on October 28 in New York City. The couple are now at home at 2901 Drayton Street, Savannah, Ga.

George Mangurian is working for the Chance-Vought Corporation in Hartford doing his bit to help along American aviation. George has been in the habit of alternating his week-ends between New York and Boston. — The right reverend Ames Hettrick has returned to Boston for a short breathing spell after completing a job in Pottsville, Pa., for the Stone and Webster Engineering Corporation. Ames is expecting that further activities at Pottsville will take him back there for at least another year. — Ray Wofford, that architectural Texan of Technique's '26 and '27 football teams, is working for a Boston architectural firm located in the Park Square Building, Boston. He believes in living with fellow artisans for he is now living with another graduate and two undergraduate architects.

The services of Bill Kirk, I, and Harvard Business School, are now being claimed by the Lee Higginson Trust Company of Boston. — Joe Parks is now on the road for the E. I. Patch Company of Stoneham, Mass., doing sales promotional work. — Charles Richheimer has recently returned from a trip to the Orient with his family. He is now working with his father at the Tricolator Company, New York City. — We are proud to announce the first indication of real authorship budding forth among the graduates of the '28 delegation. William (Willie) Beard and his father have collaborated to write a philosophical treatise on science and engineering called the "American Leviathan." — GEORGE I. CHATFIELD, *General Secretary*, Room 11-203, M. I. T., Cambridge, Mass.

COURSE III

A very interesting letter was received from R. T. Wilson. Bob is in line for congratulations as he is one of the boys who has left the ranks of the bachelors. He was married in April to Miss Virginia Lee Stuart. The couple is living at Mount Pleasant, Mich., where Bob is a production engineer for the Pure Oil Company. We are all for you, Bob, and more power to you. — WILLIAM H. WOODS, *Secretary*, c/o Gulf Production Company, Houston, Texas.

COURSE VI

Vic Decorte, who is with Tel. & Tel., recently wrote a welcome letter stating that he had been out of the U. S. A. for five months, in Canada and Newfoundland, where he did some work on superimposed circuits, that is, a channel of a.c. cable communication superimposed on the regular d.c. channel. Vic states that he had a grand time, and "sure did blow the foam off the mugs."

We understand from Vic that Ernie Kashar is also a member of the group that favors the Brooklyn Edison Company with its services. Slowly but surely do we accumulate knowledge of where you fellows are hiding out — "the mills of the Gods grind slowly, but they grind exceedingly fine."

Goldstein is working at Washington in the Patent Office, but since the news comes to us indirectly, it is necessarily devoid of elaboration. Further details will be appreciated. — Laurie Glassman graciously complied with our recent request for a letter to say that he is with Gibbs & Hill, Consulting Engineers. Let him tell you himself: "The Company is handling the Pennsylvania Railroad electrification and it is a mighty big job. When I started here my work consisted of designing catenary bridges, that is, the bridges that support the over head wires. Last June, I transferred to the Project Division, for which a more appropriate name would be the Electrical Engineering Department. I now rank as assistant engineer in this division. Our work consists of almost any problem that occurs in connection with future electrification and those sections already completed."

Glassman tells of meeting Alex Fowler, who is with the American Tel. & Tel. In just what capacity Fowler serves Tel. & Tel. is not made clear. I wish he would drop a line himself to set us straight on it. — Your Secretary met Bill Hall recently at the Institute. Bill is a member of the Staff of the Electrical Engineering Department, and shares the same office with Johnny Russell. This gives the Class quite a representation in the department. But more of that anon. — PETER H. KIRWIN, *Secretary*, 7 Grosvenor Place, Roxbury, Mass.

1929

With this issue of The Review comes an excellent opportunity to check up on our own Alumni and ask how many missed the '29 notes last month. If you did, please ask yourself whether you had done your part toward filling a column or two of interesting news for that issue. Really, it is not too early or too late to begin disclosing the facts about yourselves. We will all be glad to hear from you whether or not you are your Course Secretary. If each of us could do a little or more of us do a lot to make the news interesting, we would go a long way toward making our Class a unit. Make it a New Year's resolution to write us a word or two about yourself.

The following is another of those most enjoyable and appreciated letters from Tubby Turner who wishes that the '29 notes were fuller and does something about it: "In the last Review was mentioned that Hunter Rouse has been shouting praises of German beer. I'd like to join him in the good work. That we are both sincere seems rather evident when you consider that Rouse wants to stay another year, and I, too, am going to be here at least that much longer. But it would do us both, no doubt, a great injustice to infer that the national fluid alone was the cause of our prolonged visits. Indeed, for my part, the lack of ice cream, funny papers and apple pie almost (but not quite) overweighs the advantages of that noble beverage. There is a so-called ice cream, that is true — but it is the kind that could be gotten from most any nicely frozen river in the winter time. The situation with the apple pie is better, but, nevertheless, an apple pie that is square, and worse still, that has no top, is no apple pie. And funny papers are entirely unknown. It is surprising, though, that even without these three main stays of any normal life, we manage to keep alive.

"The semester is just about to begin for us after a two months' vacation. I'm starting after a Dr. phil. The requirements are an exceptional thesis, and oral exams in four faculties, of which one must be philosophy. A pleasant prospect! The big difficulty lies, however, in finding a place vacant with some professor to do the experimental work. There are far too many students for the available space and equipment.

"The present more or less unsettled German political situation furnishes us occasionally with some exciting times. A week or so ago I happened to see the beginnings of a big political demonstration, which ended in a mob smashing almost all of the plate glass windows in one of the main shopping streets. It was the day of the first meeting of the Reichstag, whose members had been elected on September 14. Feeling was running high, for in these elections the National Socialists had won a definite and startling victory. And the National Socialists are extreme radicals, the Fascisti of Germany. So on the day of the opening of the Reichstag great crowds had formed around the building. But small demonstrations breaking out here and there in the throng made the police a bit nervous, or perhaps only cautious. At any rate, from time to time around the Reichstag they widened the circle into which no one was allowed to enter. After being asked for the third time by a cop to retreat another hundred meters, and being already almost a kilometer from the Reichstag, I gave up and came on home. Shortly after, as I read in the evening

1929 Continued

papers, a mob had formed, marched down the street, and let fly a volley of previously concealed stones and bricks at each show window. It was almost deplorable. Such an occurrence though has its explanation clearly in one of the existing post-war conditions. For this crowd of vandals consisted mostly of young people. Before the war the young men just at the adventurous age were doing their two years' compulsory military training, and a Prussian discipline was drilled into them which would have thwarted any such childish outburst as this wrecking of shop windows was. But of course there is no compulsory training now, and the army is pitiably small. It is only once in a while these days that one chances to see even a small squad of eight grey clad, steel-helmeted soldiers stamping down *Unter den Linden*, where once one of the finest armies in the world thundered along. And I must admit that I cannot help but look upon these grey-clad with a great deal of respect, much the same, indeed, as we regard our own grey soldiers of the South. For of course over here one learns an entirely new, and to us unknown, side of the story of the War. But the subject is becoming delicate and I really started off to mention the apparent inborn military character of the people. In fact, I can almost believe the story that the first signs of life a Prussian baby makes is not to bawl as most brats do, but to click its heels and stand at attention! So it seems that when these latent characteristics no longer have the opportunity to be confined to the barracks and the drill field that they break out once in a while in pure rowdyism.

"I suppose, Mr. Secretary, that you are wondering what can be biting me, to make a physicist (or at least the beginnings of one) guilty of committing himself on the subject of politics. But here it is very different from at home. The War and its consequences, and the disheartening tribute payments are still on everyone's lips, for their effects are daily making themselves known in a most intimate manner to every German taxpayer. In the everyday conversation one simply cannot avoid politics. Moreover, it is extremely interesting, being all so different from that to which we are accustomed. Wouldn't it seem strange if we at home were able to distinguish between a Republican and a Democrat by the uniform he wore! Yet here uniforms for the members of a political party are by no means unusual. And that German interests do not lie all too remote from our own is apparent when one surveys the present world-wide depression. So, have I acquitted myself?

"There just occurs to me now something which belongs up in the first paragraph; namely, the subtle influence of the beer industry on the tailoring industry. I recently bought a ready-made suit. The coat fit exactly. The trousers did, too, that is, up as far as the southern equatorial belt. But from there up to the equator they widened rapidly out, becoming at least four sizes too large at the line itself! And I'm no sliver.

"I wish some more of the '29 men who have been conspicuously absent from the columns these past two semesters would write. It's fine for you fellows who are all more or less near together, and can spread the dope to one another, but the gossip seems unable to jump the Atlantic. What has happened to Clarg and Straat, and to that illustrious scribe Prunes Meissner? *Redet doch einen ton, meine Lieben!*" Turner's address is bei von Arnim, Berlin-Friedenau, Deutschland, Albestrasse 14III.

Now if someone would only stick out his chest and say that Tubby's a piker when it comes to writing and just try to compete with him, we'd all cheer ourselves hoarse. At present, however, we can all bow down to Tubby and thank him for that great letter from abroad. Judging from both Tubby's and Hunter Rouses's accounts of student life in Germany, it must be most enjoyable. Let's just step out and tell them how we are living, working, and enjoying life here in the States. That still leaves Hunter Rouse room to comment further on the beer situation in Germany supplementing Tubby's remarks on the same and on the present political situation.

Meanwhile I'll sit at a desk recording all the letters which pour in from '29 Alumni who have read Tubby's sample and our appeal. Of those '29 men Tubby asked for, Cap Clary is the only one on whom I can offer information. Only a few weeks ago, I saw Cap tearing around Akron in a Ford coupé so I guess that he is still in Akron working for Firestone. I hope that Straat and Meissner will write Tubby themselves.

Congratulations are due Hugh Hamilton and Mrs. Hamilton for they are now the proud parents of a baby girl who was born in September. — Harold Baker, the Class' perennial undergraduate secretary is an instructor in engine lab at the Institute and is presumably doing graduate work also. — Paul Baker, Hal Fairchild, and Olly Pierson have successfully completed their Flying cadet training courses at Brook and Kelly Fields. Paul and Hal are now working for airplane manufacturers, while Pierson is at the Institute taking graduate studies in aeronautics. — EARL W. GLEN, *General Secretary*, 339 Hillwood Drive, Akron, Ohio.

COURSE I

It must be that some of the gang have a hearty dislike for the Secretary or else they are afraid of his publicity, for the same ones still refuse to tell where they are hiding. Rumor and DeFabritis still remain the only sources of information. Def is reliable but rumor is not so accurate so write and give us the whole story.

Snow, Alexieff, and Whitehead are all working for Merritt, Chapman, Scott Company. Snow has been in Bucksport, Maine, working on the foundations for a new bridge over the Penobscot River. Alexieff and Whitehead are in San Pedro, Calif. — Jack Hallahan has been around Boston this fall. It is said that he is thinking of going into aviation. — The Secretary met Tallman on the street in Boston one day early in October. He has been working for the New England Power Company on their Fifteen Mile Falls project. — George Logan was transferred about the middle of October from Boston to Lackawanna, N. Y., where the company for whom he works is doing a job for the Bethlehem Steel Company. — Bob Phillippe has at last been found. His address is 3720 81st Street, Jackson Heights, L. I. He is working for a contractor on subway construction and is said to be enthusiastic about his work.

Another lost soul has been found in the form of Rudy Wisbrun. Rudy worked for a while on the water supply viaduct between New York City and the Catskills. Evidently the job was too deep for him, for he is back at the Institute studying for a Master's Degree but not in Course I. — Kittredge's address at last reports was Pension Clessler, München, Germany. In a letter to DeFabritis he mentions having had a visit with Hunter Rouse. He also says that the life of a foreign student in Germany has many and varied complications, not the least of which is the language. — The Secretary changed his job the last of October and is now employed as a junior hydraulic engineer with the U. S. Geological Survey, Water Resources Branch, where he is learning the fine points of stream guessing. — GORDON R. WILLIAMS, *Secretary*, 37 Mugford Street, Marblehead, Mass.

1930

After a long silence your Secretary has finally managed to gather enough news about the members of this Class to make it worth while to write it up. If you want to have more news about your classmates, do your bit and send in some news about yourself. What little I have been able to gather has come mostly through N. D. Kenney who is working in Perth Amboy, N. J., for the Standard Underground Cable Company. He and Luery dropped in on me a few weeks ago and gave me the low-down on some of our classmates. It seems that Biggane is working in Jersey City for the American Can Company. — Moriaty is in the Bell Labs in New York City, and will be very glad to act as a guide to anyone who would like to find the equivalent of Jake Worth's in the big city.

News has also come to me of the following weddings and engagements. Darrall Parsons married Miss Marion B. Lawrence. Thomas MacLaren also of '30 helped in the capacity of usher. — The wedding of Joseph Rehler to Miss Marion G. Dobbins was a true Technology affair. Art Demars '31 was best man and Johnnie Laustaunau '32 was one of the ushers. — Duckie Drake's engagement to Miss Gladys Heeley has been announced and December 12 set as the big day. — Bill Larkin and Miss Virginia Rood have announced that they intend to be married sometime in the near future. — Sticky Tarr, who is at present working in Brooklyn, now has a good excuse to get Saturday mornings off. His engagement to Miss Dorothy Dummer has been announced but no date has been set for the

1930 Continued

wedding. — Rumor also has it that Polly Betts has become Mrs. R. C. Elderfield and that the couple are living in New York City. If this is true we all understand why Polly refused to be interviewed last spring in regards to a job.

Please get in touch with your Course Secretary and send us all the news, scandal, and dirt regarding any and all of your friends and classmates. If you don't know who your Course Secretary is, write to me and I will send his name and address. — MORELL MAREAN, *General Secretary*, 180 Gordon Street, Perth Amboy, N. J.

COURSE X

With the close of the year, the practice school period for those in the Course who went into the work of Course X-A is finished, and the three groups return to the Institute for graduate work until January. Thus far, the outstanding achievements seem to be a number of records for long distance driving over week-ends to points far removed from Buffalo, Bangor, and Winchester, several claims to the brown derby offered for the greatest number of consecutive nights at the movies, and a rather complete list of the various points of refreshment within a convenient distance of the Buffalo clubhouse.

While in Bangor at the start of the football season, the group of which Riehl, Holt, Bolzow, Peters, Holden, Rowzee, Wilson, and Weinrich are prominent and conspicuous members decided to have a clash with some of the local talent, and a challenge was issued to the town high school team.The details of the game were all settled when it was suddenly discovered that the Technology all-stars lacked the necessary paraphernalia — helmets, pads, shoes, and so on — and as they were unable to arrange to get enough for the team, the idea had to be abandoned. Too bad, for it would have been a glorious opportunity to place the name of the practice school high in the records of Technology athletic success.

As a member of the "Yale Bull Dogs," George Gassett made a European trip last summer, and the saxophone that had long been heard in the music of the "Techtonians" played under the Yale blue. Since his return, he has been working in Boston. — Sock Harmon is also in Boston, doing inspection work for the Associated Factory Mutual Fire Insurance Companies, and living at 468 Commonwealth Avenue. — While in Bangor, Carl Franz met John Pratt ex-'30 who is remembered for his fine work as fullback on the Class Field Day football team. He is now doing construction work in Bucksport, Maine.

Now that it's over six months since our graduation, there has been plenty of time for things to have happened to members of our Course. New jobs, new opportunities, scattered to different parts of the country, there should be some interesting news to pass on in The Review. Send it in, and I'll do my best to see to it that it breaks into print. — HOWARD S. GARDNER, JR., *Secretary*, 18 Westcott Street, East Orange, N. J.

Washington Society of the M. I. T.

President Karl T. Compton was the guest of honor and principal speaker at a dinner given by the Washington Society of the M. I. T. at the University Club, Washington, D. C., on Saturday, October 25, 1930.

Mr. Kenneth P. Armstrong, President of the Washington Society, introduced the Toastmaster, Mr. Frederick H. Newell '85, who whetted the intellectual appetites of the members with his interesting introduction of the new President of Technology. Dr. Compton spoke at length concerning his impressions of the Institute and some of the present and future problems with which it has to cope. He traced the history of the Student Loan Fund from its inception to its accomplishment. He touched upon the ever-present problem of dormitories; the relative growth of the several courses and departments; expansion programs; and many other phases of the Institute's growth and activities; all with such attention compelling energy and interest, that although his talk lasted over an hour and a half, everyone seemed ready and willing to listen as long as he would continue.

Attendance was limited to Technology graduates, and among those attending were the following: Marion I. Walters, Charles G. Abbot, Kenneth P. Armstrong, Rollin S. Baldwin, Charles Bittinger, Paul A. Blair, George K. Burgess, Joseph W. Clary, W. Lorrain Cook, Clarence L. Brown, W. Malcolm Corse, Richard W. Cushing, Alden W. Dartt, W. Clark Dean, Proctor L. Dougherty, Christopher W. Duffy, John D. Fitch, Samuel B. Gahm, L. F. Gardner, Charles H. Godbold, Alfred E. Hanson, Lyman F. Hewins, Amasa M. Holcombe, T. E. Howe, N. Howitt, Frederick A. Hunnewell, Martin Boyle, Alden White, David A. Lundquist, George E. Marsh, James D. McIntyre, H. C. Norris, William E. Parker, Chester Peterson, George A. Ricker, J. Garfield Riley, Frederick F. Schaller, Karl E. Schoenherr, Frederic W. Southworth, George W. Stone, Charles H. Stratton, Frederick W. Swanton, Walter I. Swanton, George M. Tapley, Harry W. Tyler, Willis G. Waldo, Francis Walker, Alexander W. Yereance, Watson Davis, Frederick H. Newell, Wilson Compton, Karl T. Compton, and Major W. E. R. Covell. The entire Society heartily appreciates the honor of having been able to entertain, and be entertained by the new President of Technology.

Mr. John L. Nagle was the guest and speaker at the regular luncheon meeting of the Washington Society held at the University Club, Washington, D. C., Friday, November 21, 1930. Mr. Nagle, who is designing engineer of the new Arlington Memorial Bridge, spoke at considerable length on the numerous interesting structural and architectural features of the bridge which have not heretofore been given any extended publicity, and also related many interesting incidents which have occurred during the planning and building of the bridge and plazas. As an introduction to his discussion of the bridge, Mr. Nagle mentioned the new course of Humanics recently established at Technology, and at the close of his talk, after he had answered a great many questions concerning the bridge, the members reverted to a discussion of the course on Humanics which lasted until the meeting was forced to break up by the lateness of the hour. — JOSEPH Y. HOUGHTON '28, *Secretary*, 402 Shepherd Street, Chevy Chase, Md.

The M. I. T. Club of Western Pennsylvania

On Tuesday, October 28, the club held its second annual golf tournament at The Country Club, Pittsburgh, followed in the evening by a dinner at the clubhouse. Among the dubs and duffers who turned out for the tournament were two of the M. I. T. Club's past presidents, George E. Whitwell '15, and George W. Ousler '16, otherwise known as "The Two Georges." As might have been expected, the playing of the day was featured by the incomparably brilliant golfsmanship of H. W. (Ambie) Dexter, Jr. '23, who will be remembered by his classmates and others as the Institute's outstanding shot-putter and weight-thrower extraordinary. On certain of the more difficult holes on the course Dex was lost, strayed or stolen for days at a stretch; his score for these holes was upward of 20 strokes — that is, per hole. Outside of such coruscant flashes of skill and the fact that there were no unusual scores made on the 19th hole, the golf was just about normal — in other words pretty bad.

The dinner which followed the tournament was the M. I. T. Club's first dinner meeting of the 1930–1931 season. After the serving of the dinner, preliminary plans for the Club's activities were discussed. Mr. Forrest G. Harmon '23, temporarily in Pittsburgh on business, conveyed to the Club the greetings of the M. I. T. Club of Southern California. Mr. Harmon outlined the organization of the California group, and stressed the keen interest shown in Institute affairs by the Technology men of California.

The Secretary wishes to take this opportunity to invite all Technology men coming to Pittsburgh to attend the weekly luncheons and the monthly dinner meetings of the Club. The luncheons are held in McCreery's dining room, Sixth Avenue and Wood Street, Pittsburgh; the dinner meetings will be held at the University Club on dates to be announced. — CLARENCE B. ROGERS, '14, *Secretary*, 5839 Beacon Street, Pittsburgh, Pa. SAMUEL J. HELFMAN '24, *Assistant Secretary*, 435 Sixth Avenue, Pittsburgh, Pa.

Indiana Association of the M. I. T.

The President of the Indiana Association sent in the following notes: Professor James S. Tryon stopped off at Indianapolis while on one of his tours of colleges and schools. The Indiana Association entertained him on Wednesday, November 12,

at the University Club. After dinner, attended by a small but representative number, Dr. Tryon discussed with us a number of questions concerning the Institute. A very general discussion followed during which many questions were asked and many suggestions were made by the Alumni. The evening proved an interesting one to all.

While in the city Dr. Tryon addressed a large body of students at Shortridge High School; addressed a group at Butler University; visited the Park School for Boys from which there will be at least one recruit at Technology next year; called at Arsenal Technical High School, one of the largest schools in the country; and viewed Manual Training High School. — NORMAN D. DOANE '15, *Secretary*, 2035 North Meridian Street, Indianapolis, Ind.

Technology Club of Lake Superior

The annual meeting of the Technology Club of Lake Superior was held on Monday evening, November 24, at the Kitchi Gammi Club, Duluth. Eighteen alumni and their guests were present at the dinner which was served on the Wedgwood Technology plates which were loaned for the occasion by Mrs. J. A. Noyes. The meeting was presided over by Mr. William C. Lounsbury of Superior, retiring President, and the principal address was made by Dr. James L. Tryon of the Department of Admissions of the Institute. The following educators were guests of the Alumni at this meeting which was followed by an interesting round table discussion on the general subject of technical engineering and the requirements for admission and ways and means for the preliminary schools to coöperate most effectively: Dean R. D. Chadwick, Duluth Junior College; A. D. S. Gillett, President Superior Teachers' College; Clifford G. Wade, Principal Superior Central High School; A. M. Santee, Principal Duluth Central High School; Ashley T. Conrad, Principal Superior East High School; Horace Glen, Dean of Boys, Superior Central High School; Henry Gilruth, Principal Morgan Park High School; James F. Taylor, Principal Duluth Denfeld High School.

The new officers that were elected at this meeting are: Holman I. Pearl '10, President and Frank Hayes '90, Secretary. — Communications were read from Bernard E. Proctor, the Club's representative on the Alumni Council, and from Charles E. Locke, Secretary of the Association. — In the absence of Mr. Pearl, Mr. Hayes responded for the new officers. — JONATHAN A. NOYES '12, *Secretary*, 1507 Alworth Building, Duluth, Minn.

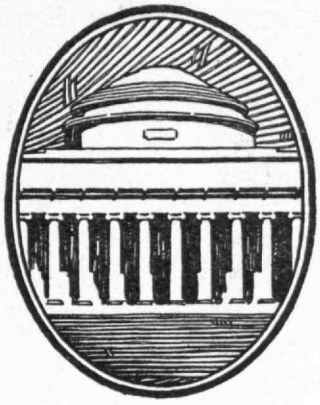
Technology Club of Virginia

On Friday morning, October 24, President Karl T. Compton made an address at the formal opening of the new Physics Building, Richmond Hall, at the University of Richmond. — President Compton also addressed the Phi Beta Kappa meeting at the University in the evening. Invitations to attend these events were sent all M. I. T. men in Richmond and vicinity. A large number attended and met President Compton.

On Sunday afternoon, December 7, at three o'clock a tablet was given by the Virginia Alumni and was unveiled and dedicated by J. Scott Parrish, President of the Technology Club of Virginia. It bears the following inscription: William Barton Rogers, December 7, 1804–May 30, 1882, Professor of Natural Philosophy at University of Virginia, 1835–1853, Founder 1859 and President 1865–1870, 1878–1881 of the Massachusetts Institute of Technology, In whose memory this tablet is placed by the Virginia Alumni of the Institute, December 7, 1930. — The program of dedication was as follows:

1. Unveiling of tablet and dedication, by J. Scott Parrish, President, Virginia Section of M. I. T. 2. Acceptance, by Dr. Edwin A. Alderman, President, University of Virginia. 3. William Barton Rogers, Professor of Natural Philosophy, by Dr. Llewellyn G. Hoxton, Head, School of Physics, University of Virginia. 4. William Barton Rogers, Founder and President of M. I. T., by a representative of the Institute. — Invitations to attend this unveiling have been sent to all the Virginia Alumni. — DONALD N. FRAZIER '11, *Secretary*, 1215 Mutual Building, Richmond, Va.

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D: For information on Advanced Study and Research Work, ask for Bulletin D.

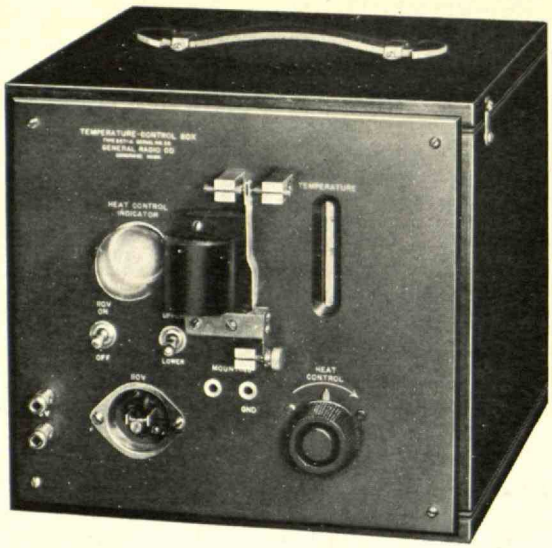
E: For the reports of the President and of the Treasurer, ask for Bulletin E.

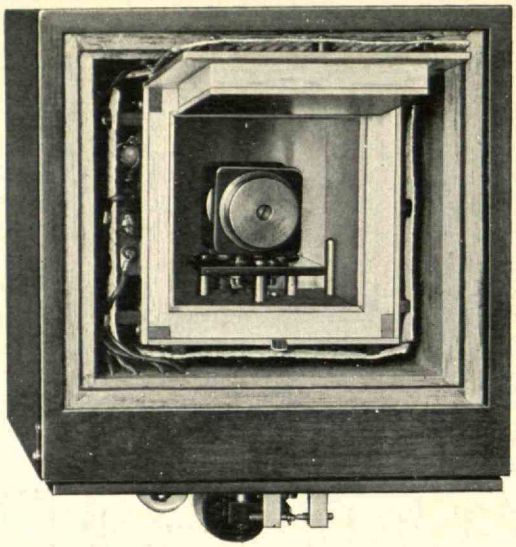
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